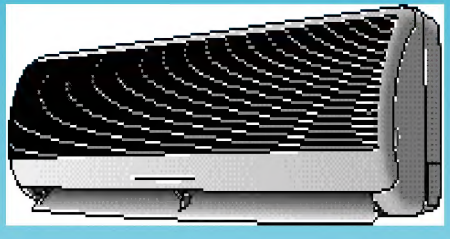
SAMSUNG

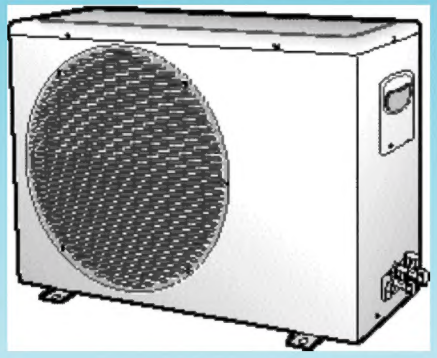
ROOM AIR CONDITIONER

INDOOR	OUTDOOR
AQ07A1AE	UQ07A1AE
AQ07A2AE	UQ07A2AE
AQ07B1AE	UQ07B1AE
AQ07B2AE	UQ07B2AE

SERVICE Manual

AIR CONDITIONER





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1. Precautions

1. Warning: Prior to repair, disconnect the power cord from the circuit breaker.

2. Use proper parts: Use only exact replacement parts. (Also, we recommend replacing parts rather than repairing them.)

3. Use the proper tools: Use the proper tools and test equipment, and know how to use them. Using defective tools or test equipment may cause problems later-intermittent contact, for example.

4. Power Cord: Prior to repair, check the power cord and replace it if necessary.

5. Avoid using an extension cord, and avoid tapping into a power cord. This practice may result in malfunction or fire.

6. After completing repairs and reassembly, check the insulation resistance. Procedure: Prior to applying power, measure the resistance between the power cord and the ground terminal. The resistance must be greater than 30 megohms.

7. Make sure that the grounds are adequate.

8. Make sure that the installation conditions are satisfactory. Relocate the unit if necessary.

9. Keep children away from the unit while it is being repaired.

10. Be sure to clean the unit and its surrounding area.

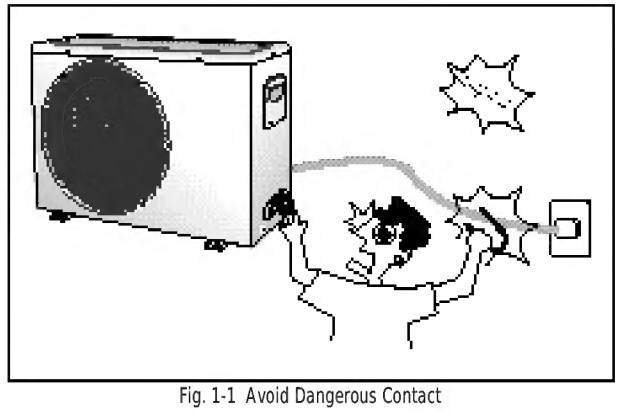


Fig. 1-1 Avoid Dangerous Contact

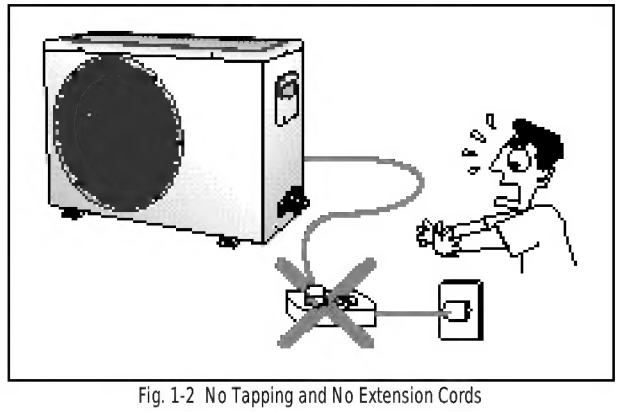


Fig. 1-2 No Tapping and No Extension Cords

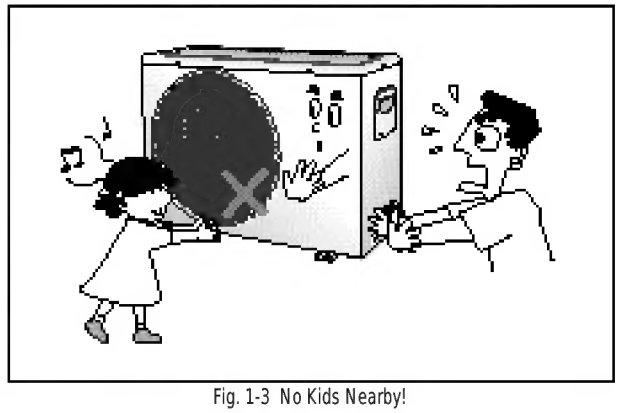


Fig. 1-3 No Kids Nearby!

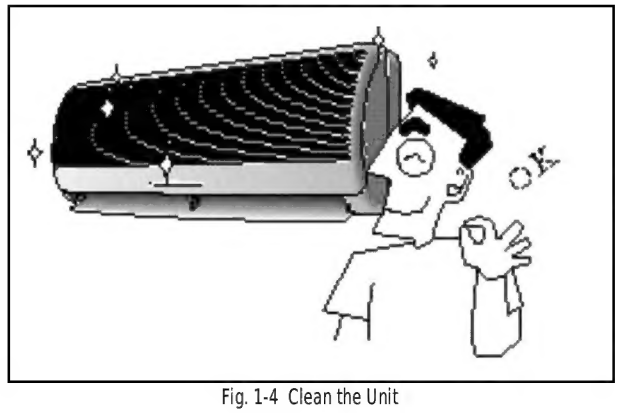


Fig. 1-4 Clean the Unit

MEMO

2. Product Specifications

2-1 Table

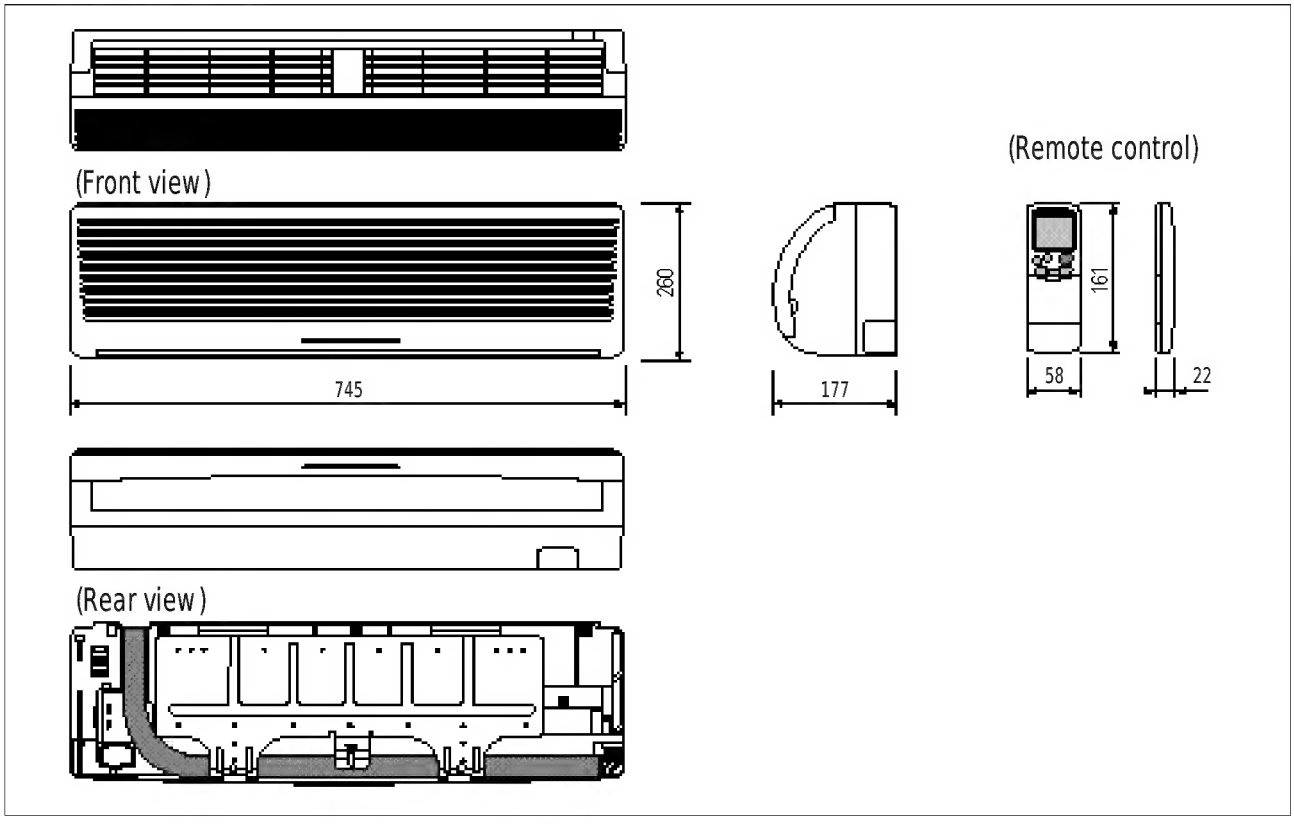
Item				Model	AQ07A1AE/AQ07B1AE/AQ07A2AE/AQ07B2AE	
					Cooling	Heating
Power Source					220/240V~,50Hz	
Perfor-mance	Capacity			KW	2.05	2.20
				BTU/h	7,000	7,500
	Air circulation (High)			m^3/min	5.2	5.4
	Moisture removal (High)			Liters/h	0.9	-
Electrical Rating	Available voltage range			V	198~264	
	Running amperes			A	3.1	2.9
	Power input			KW	0.71	0.66
	Power factor			%	95.4	94.8
	Energy efficiency ratio			BTU/wh	9.9	11.4
	Compressor locked rotor amperes			A	17	
Features	Controls/Temperature control				Microprocessor/I.C Thermostat	
	Control unit				Wireless remote control	
	Timer				Q-Timer/24-Hour On or Off	
	Fanspeed			Indoor/Outdoor	3 Steps and Turbo/1 Step	
	Airflow direction(indoor)			Horizontal	Manual	
				Vertical	Auto	
	Comperssor				Reciprocating(Bristol)	
	Refrigerant/Amount charged at rating			g	R22/620	
	Refrigerant control				Capillary tube	
	Operation sound	Indoor		dB-A	32	
		Outdoor		dB-A	45	
	Refrigerant tubing connections				Flare type	
	Max. allowable tubing length at shipping			m	5	
	Refrigerant tube diameter	Narrow tube		(in.)	6.35(1/4")	
		Wide tube		(in.)	9.52(3/8")	
	Refrigerant tube kit/Accessories				Optional/Hanger-plate	
Dimensions & Weight					Indoor unit	Outdoor
	Unit dimensions	Height		mm	260	497
		Width		mm	745	660
		Depth		mm	177	235
	Package dimensions	Height		mm	328	569
		Width		mm	818	764
		Depth		mm	246	333
	Weight	Net		kg	8	26
		Shipping		kg	10	28

Remarks : Rating Conditions are :

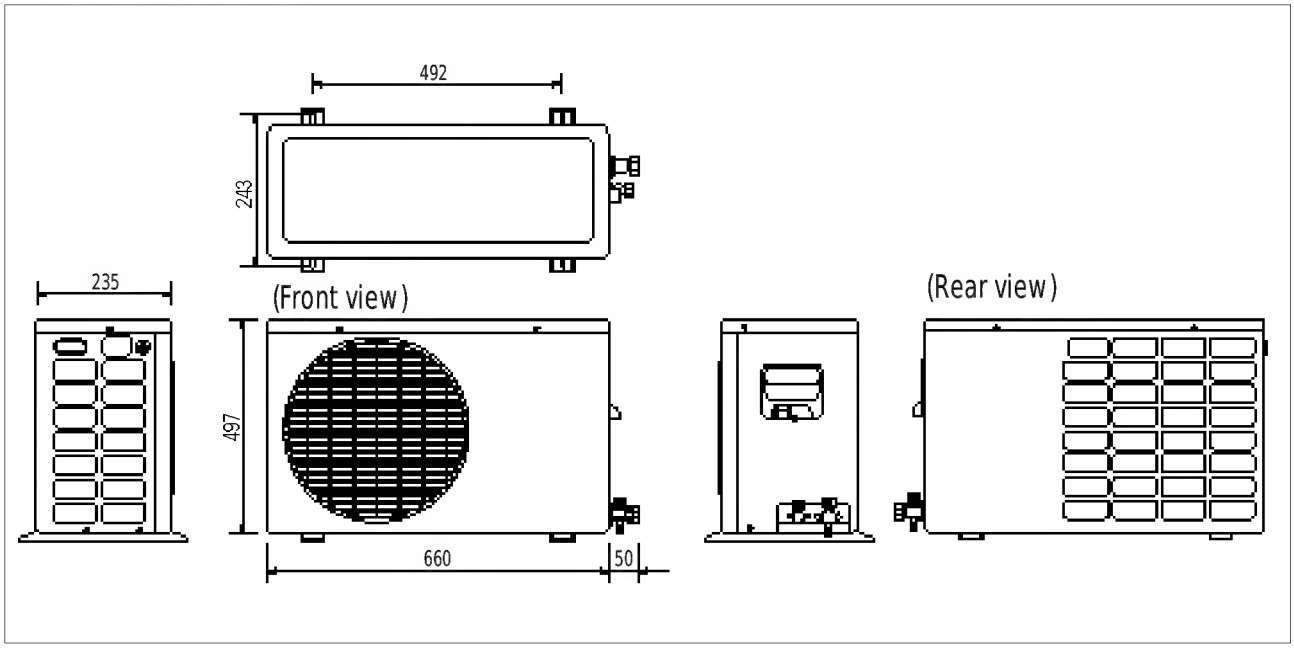
	COOLING	HEATING
Indoor air temperature	27°C DB/19°C WB	20°C DB/15°C WB
Outdoor air temperature	35°C DB/24°C WB	7°C DB/6°C WB

2-3 Dimensions

2-3-1 Indoor Unit



2-3-2 Outdoor Unit



3. Operating Instructions and Installation

3-1 Operating Instructions

3-1-1 Name & Function of Key in remote controller

NO		NAMED OF KEY		FUNCTION OF KEY
1				On/Off Button. Use this button to start and stop air conditioner.
2			▲ (UP)	Temp. up button. If the ▲ button is pressed once, the setting temperature is increased by 1°C
			▼ (DOWN)	Temp. down button. If t ▼ button is pressed once, the setting temperature is decreased by 1°C
3		MODE		Each time you press this button, MODE is changed in the following order. : Auto Mode : Cool Mode : Dry Mode : Fan Only Mode : Heat Mode
4		TURBO		Use this button to provide heavy duty cooling & Heating for 30 minutes.
5		OFF		Set up the reserve or cancel the timer on and timer off quickly
6				Use this button for sleep operation. (The SLEEP mode can be selected at COOL and HEAT mode.)
7				Adjusts air flow vertically.
8				Each time you press this button, FAN SPEED is changed in the following order.
9	COVER	TIMER	ON TIMER	Set up the time that operation start.
10			OFF TIMER	Set up the time that operation stop.
11			SET	Use this button to reserve the timer on.
12			CANCEL	Use this button to reserve or cancel the timer on and timer off.
13			(UP)	If the button is pressed once, the time increase by one minute during the time set mode, and ten minutes during the timer set mode.
14			(DOWN)	If the button is pressed once, the time decrease by one minute during the time set mode, and ten minutes during the timer set mode.
15			TIME	Without regard to ON/OFF condition in remote controller, use this button to set current time. Adjust the current time using button. (Data can be transmitted after setting up the time)

3-1-1 Name & Function of Key in remote controller

1. AUTO MODE : In this mode, operation mode(COOL, HEAT) is selected automatically by the room temperature of initial operation.

Room Temp	Operation Type
Tr≥ 21°C+ΔT	Cool Operation (Set Temp:24°C+ΔT)
21°C +ΔT>Tr	Heat Operation (Set Temp : 22°C+ΔT)

   ΔT= -2°, -1°C, 0°C+1°C+2°C
   ΔT is controlled by setting temperature up(▲)/down(▼) key of remote controller

2. COOL MODE : The unit operates according to the difference between the setting and room temperature. (18°C~30°C)

3. HEAT MODE : The unit operates according to the difference between the setting and room temperature.(16°C~30°C)
   *Prevention against cold wind : For about 3~5 minutes after initial operation, thermo control or "de-ice", the indoor fan will either not operate or operate very slowly, then switch to the selected fan speed. This period is to allow the indoor unit's heat-exchanger to prewarm before emitting warm air.
   *High temperature release function : The outdoor unit for and compressor ON/OFF control for safety operation, when the over-heat is heat exchanger of indoor unit.
   *De-ice : Deicing operation is controlled by indoor unit's heat exchanger temperature and accumulating time of compressor's operation.
   De-ice end by sensing of the processing time by de-ice Condition.

4. DRY MODE :
   The unit operates in DRY mode.
   *Compressor ON/OFF Time is controlled compulsorily(can not set up the fan speed, always breeze).
   *Protective function : Low temperature release. (Prevention against freeze)

5. TURBO MODE : This mode is available in AUTO, COOL, HEAT, DRY, FAN MODE.
   When this button is pressed at first, the air conditioner is operated "powerful" state for 30 minutes regardless of the set temperature, room temperature.
   When this button is pressed again, or when the operating time is 30 minutes, turbo operation mode is canceled and returned to the previous mode.
   *But, if you press the TURBO button in DRY or FAN mode that is changed with AUTO mode automatically.

6. SLEEP MODE : Sleep mode is available only in COOL or HEAT mode.
   The operation will stop after 6 hours.
   *In COOL mode : The setting temperature is automatically raised by 1°C each 1hour When the temperature has been raised by total of 2°C, that temperature is maintained.
   *In HEAT mode : The setting temperature is automatically droped by 1°C each 1hour. When the temperature has been droped by total of 2°C, that temperature is maintained.

7. FAN SPEED : Manual / Auto
   Fan speed automatically varies depending on both the difference between setting and the room temperature.

8. COMPULSORY OPERATION :
   For operating the air conditioner without the remote controller.
   *AUTO : The operating is the same function that AUTO MODE in the remote controller.

9. SWING : BLADE-H is rotated vertically by the stepping motor.
   *Swing Set / Auto : Press the button under the remote control is displayed on LCD the , and the blades move up and down, about 43°. If the one more time press the button, blatles location is stop.

10. Quick OFF TIMER: OFF timer (quick timer) allows reservation or cancel the timer on and timer off quickly
    When OFF timer button is pressed at operating state, LCD displays the polling state sequentially.
    The LCD also displays the time remaining.

11. 24-Hour ON/OFF Real Setting Timer. : The air conditioner is turned ON at a specified time using ON TIMER.
    OFF TIMER : The air Conditioner is turned OFF at a specified time using OFF TIMER.
    *ON TIMER : Only timer LED lights on.
    *OFF TIMER : Both timer and operation LED lights on.

12. SELF Diagnosis

LED DISPLAY				Check Point
operation	TIMER	FAN	Turbo	
■	○	○	○	Interruption of electric power and Power on.
○	■	○	○	Abnormal condition of the room sensor.
■	■	○	○	Abnormal condition of the indoor unit's heat exchanger sensor.
○	○	■	○	Indoor unit fan motor lock.

■ : LED blinking ○ : LED off

13. BUZZER SOUND : Whenever the ON/OFF button is pressed or whenever change occurs to the condition which is set up or select, the compulsory operation mode, buzzer is sounded "beep"

3-2 Installation

3-2-1 Selecting Area for Installation

Select an area for installation that is suitable to the customer's needs.

3-2-1(a) Indoor Unit

1. Make sure that you install the indoor unit in an area providing good ventilation. It must not be blocked by an obstacle affecting the airflow near the air inlet and the air outlet.
2. Make sure that you install the indoor unit in an area allowing good air handling and endurance of vibration of the indoor unit.
3. Make sure that you install the indoor unit in an area where there is no source of heat or vapor nearby.
4. Make sure that you install the indoor unit in an area from which hot or cool air is spread evenly in a room.
5. Make sure that you install the indoor unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).
6. Make sure that you install the indoor unit in an area which provides easy pipe connection with the outdoor unit, and easy drainage for condensed water.
7. Make sure that you install the indoor unit in an area which is large enough to accomodate the measurements shown in figure on the next page.

3-2-1(b) Outdoor Unit

1. Make sure that you install the outdoor unit in area not exposed to the rain or direct sun light.
   (Install a separate sunblind if exposed to direct sun light.)
2. Make sure that you install the outdoor unit in area allowing good air moment, not amplifying noise or vibration, especially to avoid disturbing neighbours.
   (Fix the unit firmly if it is mounted in a high place.)
3. Make sure that you install the outdoor unit in area providing good ventilation and which is not dusty. It must not be blocked by any obstacle affecting the airflow near the air inlet and the air outlet.
4. Make sure that you install the outdoor unit in area free from animals or plants.
5. Make sure that you install the outdoor unit in area not blocking the traffic.
6. Make sure that you install the outdoor unit in area easy to drain condensed water from the indoor unit.
7. Make sure that you install the outdoor unit in area which provides easy connection within the maximum allowable length of a coolant pipe(10 meters).

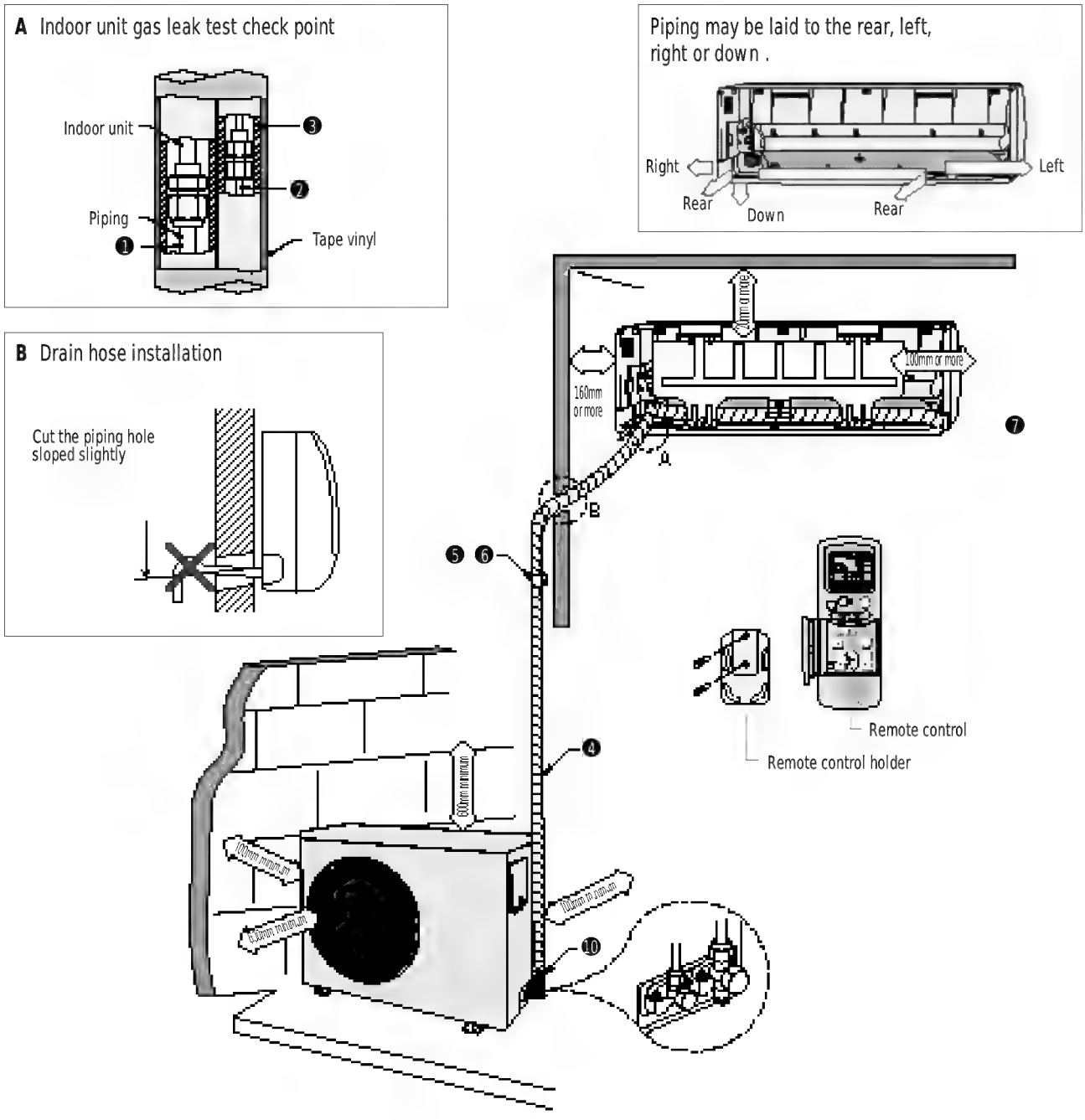
   Note
   1. Add 10g of refrigerant (R-22) for every 1 meter if the pipe length exceeds the standard pipe length of 5 meters.
   2. Maintain a height between the indoor and outdoor units of less than 3 meters.
8. Make sure that you install the outdoor unit in an area which is large enough to accommodate the measurements shown in figure on the next page.

3-2-1(c) Remote Control Unit

1. Make sure that you install the remote control unit in an area free from obstacles such as curtains etc, which may block signals from the remote control unit.
2. Make sure that you install the remote control unit in an area not exposed to direct sunlight, and where there is no source of heat.
3. Make sure that you install the remote control unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).

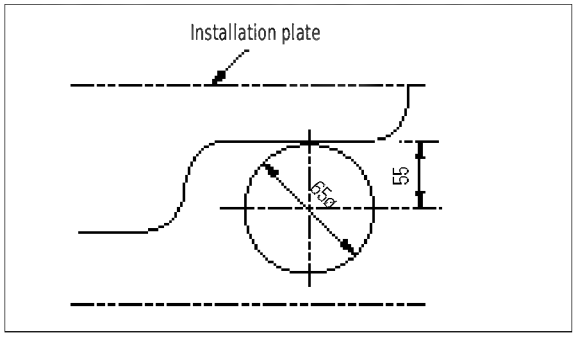
Caution :
It is harmful to the air conditioner if it is used in the following environments: greasy areas (including areas near machines), salty areas such as coast areas, areas where sulfuric gas is present such as hot spring areas. Contact your dealer for advice.

3-2-2 Installation diagram of indoor unit and outdoor unit



❶	Piping (Liquid) 1/4"	❻	Clamper tube
❷	Piping (Gas) 3/8"	❼	Installation plate
❸	Insulation tube	❽	Pipe-connection
❹	Vinyl tape	❾	Screw
❺	Putty	❿	Drain hose

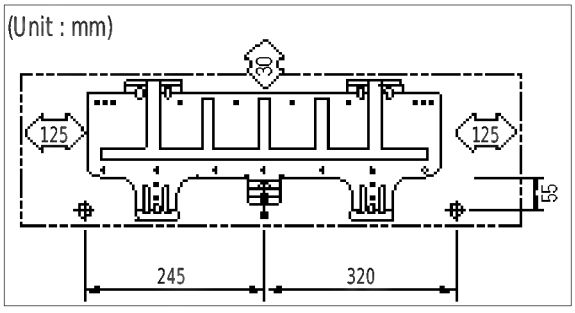
3-2-2(a) Fixing the Installation Plate



1. Determine the position of the pipe and drain hose hole using the right figure and drill the hole with an inner diameter of 65mm so that it slants slightly downwards.

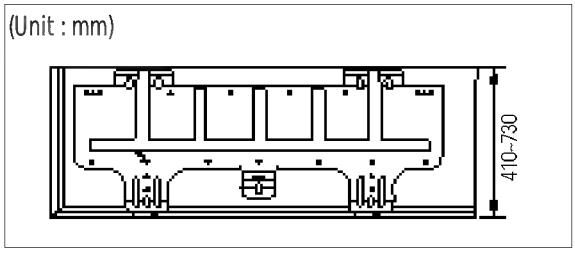
2. **If you are fixing the indoor unit to a… Then follow Steps…**

Wall	**3.**
Window frame	**4 to 6.**



3. Fix the installation plate to the wall in a manner appropriate to the weight of the indoor unit.

   If you are mounting the plate on a concrete wall with anchor bolts, the anchor bolts must not project by more than 20mm.

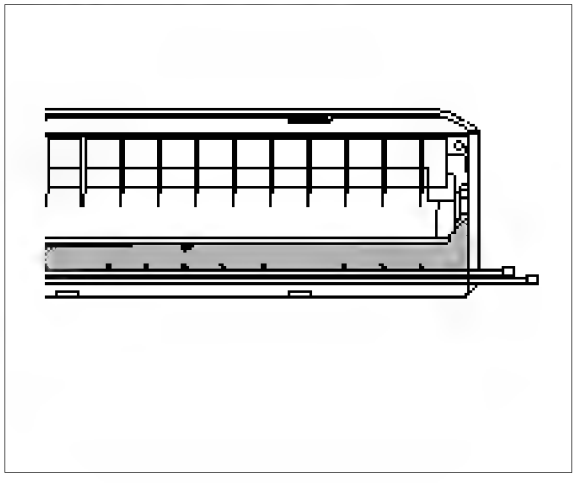


4. Determine the positions of the wooden uprights to be attached to the window frame.

5. Attach the wooden uprights to the window frame in a manner appropriate to the weight of the indoor unit.

6. Using tapped screws, attach the installation plate to the wooden uprights, as illustrated in the last figure opposite.

3-2-2(b) Purging the Unit



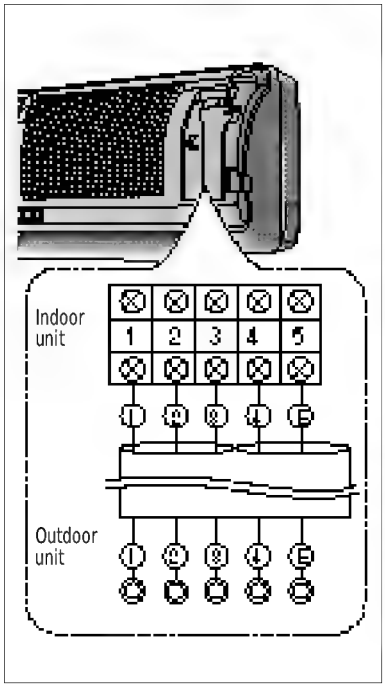
On delivery, the indoor unit is loaded with an inert gas. All this gas must therefore be purged before connecting the assembly piping. To purge the inert gas, proceed as fol - lows.

Unscrew the caps at the end of each pipe.

Result : All inert gas escapes from the indoor unit.

- **To prevent dirt or foreign objects from getting into the pipes during installation, do NOT remove the caps completely until you are ready to connect the piping.**

3-2-2(c) Connecting the Assembly Cable.

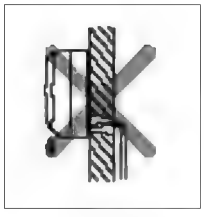


The outdoor unit is powered from the indoor unit via the assembly cable. If the outdoor unit is more than five metres away from the indoor unit, the cable must first be extended to a maximum of 15 metres.

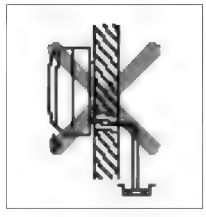
1. Extend the assembly cable if necessary.
2. Open the front grille by pulling on the tabs on the lower right and left sides of the indoor unit.
3. Remove the screw securing the connector cover.
4. Pass the assembly cable through the rear of the indoor unit and connect the assembly cable to terminals 1 to 4 and E.
   - Each wire is labelled with the corresponding terminal number.
5. Firmly fix the ass'y cable with clamp wire holder.
6. Pass the other end of the cable through the 65mm hole in the wall.
7. Replace the connector cover, carefully tightening the screw.
8. Close the front grille.
9. For further details on how to plug the other end of the assembly cable into the outdoor unit, refer to page 3-8.

3-2-2(d) Installing and Connecting the Indoor Unit Drain Hose

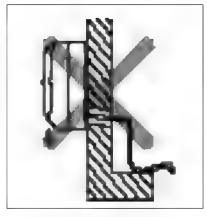
Care must be taken when installing the drain hose for the indoor unit to ensure that any condensa - tion water is correctly drained outside.l When passing the drain hose through the 65mm hole drilled in the wall, check that none of the following situations occur.



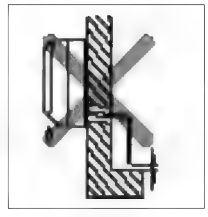
The hose must NOT slope upw ards.



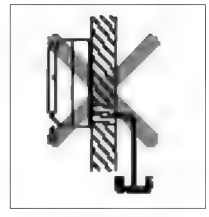
The end of the drain hose must NOT be placed in water.



Do NOT bend the hose in different directions.



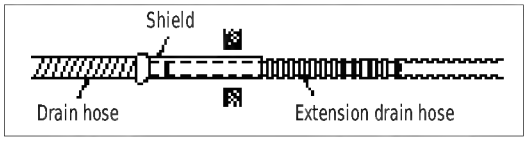
Keep a clearance of at least 5cm between the end of the hose and the ground.



Do NOT place the end of the drain hose in a hollow.

To install the drain hose, proceed as follows.

1. If necessary, connect the 2-metre extension to the drain hose.
2. If you are using the extension, insulate the inside part of the extension drain hose with a shield.
3. Pass the drain hose under the refrigerant piping, taking care to keep the drain hose tight.
4. Pass the drain hose through the hole in the wall, making sure that it is sloping downwards, as shown in the illustrations above.

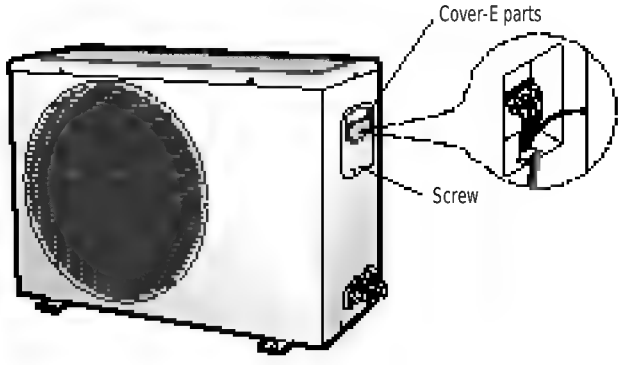


The hose will be fixed permanently into position once the whole installation has been tested for gas leaks;

3-2-2(e) Outdoor unit installation

Wiring connection

1. Remove the cover-E parts.
2. Firmly connect the cable connector in the terminal block.
3. Fasten the M4 ring terminal to the hole marked
4. Firmly fix the ass'y cable with clamp wire holder.
5. Assemble the cover-E parts.
6. To prevent the entry of water, form a trap of the ass'y cable as illustrated in the installation diagram of indoor and outdoor unit.

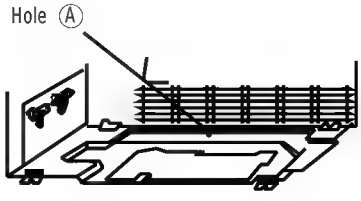


Installation of drain line

In heating and de-ice operation, condensed water may be generated.
Install drain line as following procedure.

1. Insert Drain plug into Hole Ⓐ, and then connect drain hose to drain plug.

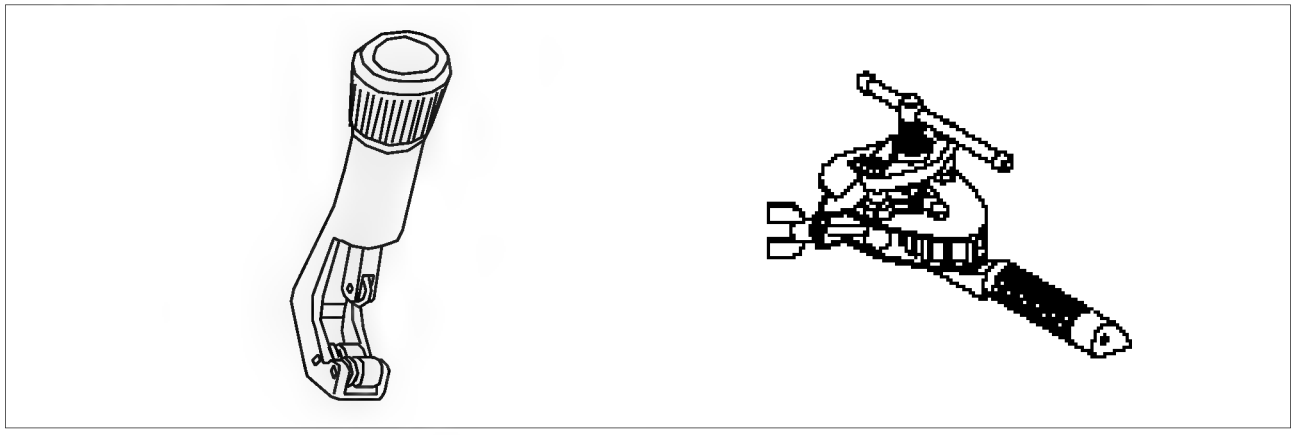
- Inside diameter of drain hose is 18mm.



Drain Plug

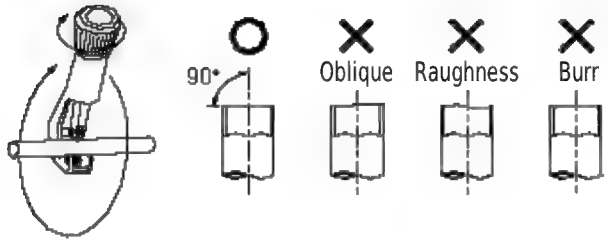
3-2-2(f) Flare Modification

• Tools used



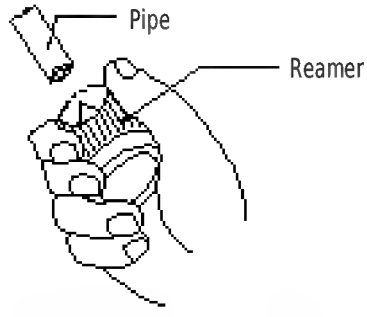
Flare modification procedure

1) Cut the pipe using a pipe cutter.

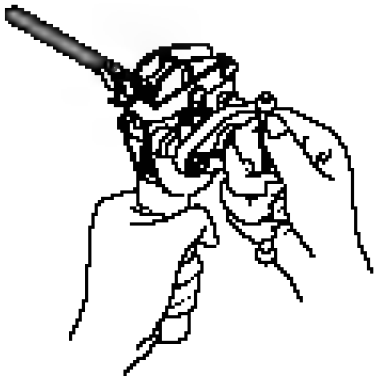


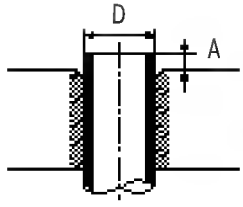
2) Remove burrs at the tip of the pipe cut.

Caution : Burrs not removed may result in leakage of gas.



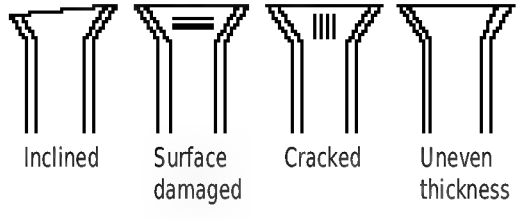
3) Insert a flare nut into the pipe and modifty flare.





Outer diameter	A(mm)
ø6.35mm	1.3
ø9.52mm	1.8

* Unproper flaring



3-2-2(g) Air-Purge Procedure

• Use the refrigerant of the outdoor unit to purge air inside indoor unit and pipe.

1. Remove the caps from the 2-way valve(B) and the 3-way valve(A).

↓

2 Turn the 2-way valve cock approx. 45° counterclockwise to open it. Close it about 10 seconds later.

↓

3 Check refrigerant leakage of each joint parts (A, B, C & D in right figure)

↓

not leaking

Leaking

If leaking, tighten the flare nut one more time. If continues to leak, although the pipe fixing area has been tightened again, repair the leaking area.

4. Open the 2-way valve again.

↓

5. Open the service valve cap of the 3-way valve and press the needle valve to discharge gas for 3 seconds and leave it for about 1 minute.
Repeat the above procedure for 3 times to purge air.

↓

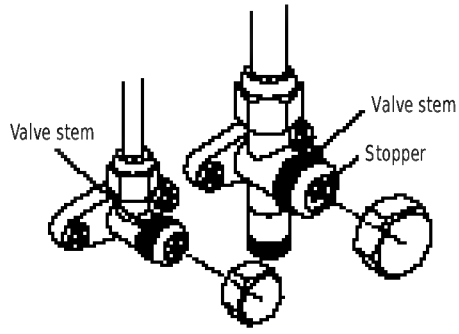
6. Open the 2-way valve and 3-way valve completely

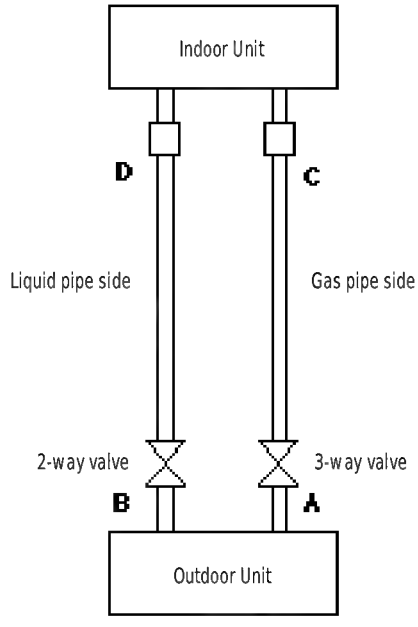
↓

7. Close the cap of each valve.

↓

8. Check each valve for leakage.





3-2-2(h) Refrigerant Refill

• Refill an air-conditioner with refrigerant when refrigerant has been leaked at installing or using

1. Purge air(for new installation only).

↓

2. Turn the 3-way valve clockwise to close, connect the pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.

↓

3. Connect the tank to refill with Refrigerant

↓

4. Set the unit to cool operation mode.

↓

5. Check the pressure indicated by the pressure gauge(low pressure side).
   * Standard pressure is should be 4.5~5.5kg/cm^2 in a regular, high operation mode.

↓

6. Open the refrigerant tank and fill with refrigerant until the rated pressure is reached.
   * It is recommended not to pour the refrigerant in too quickly, but gradually while operating a pressure valve.

↓

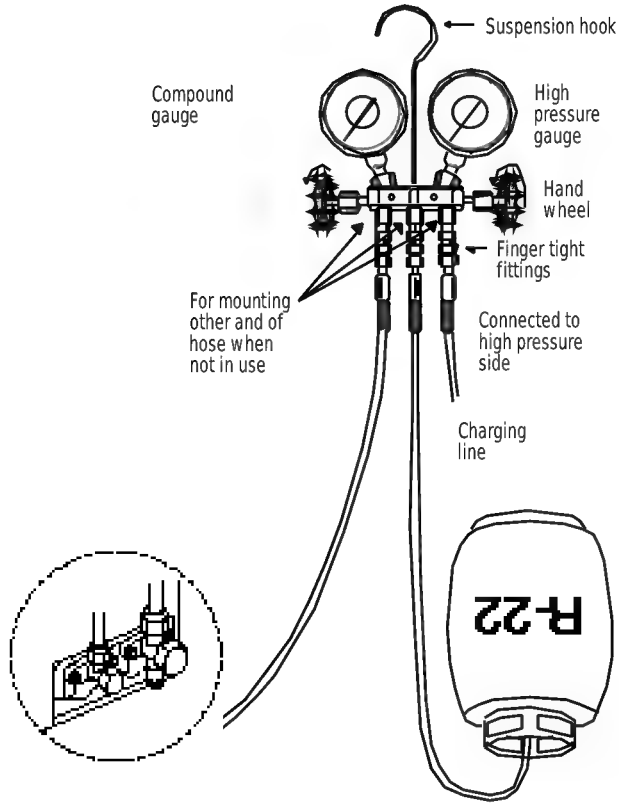
7. Stop operation of the air conditioner.

↓

8. Close the 3-way valve, disconnect the pressure gauge, and open the 3-way valve again.

↓

9. Close the cap of each valve.



3-2-2(i) Refrigerant Adjustment

Class	At installation		At service	
Connection Pipe Length	Air-Purge Method	Refrigerant Adjustment	Air-Purge Method	Refrigerant Quantity
5m Max.	Refer to the detailed Air-Purge Procedure	Unnecessary	Purge air using a vaccum pump or an additional refrigerant cylinder.	refer to specification sheet
5~10m		Add 10g of refrigerant (R-22) for every 1m.		Add 10g of refrigerant (R-22) for every 1m.

3-2-2(j) Flare unt fixing torque

Outter diameter	Torque (kg-cm)	
	Fixing Torque	Final Torque
ø 6.35 mm (Liquid Side)	160	200
ø 9.52 mm (Gas Side)	300	350

3-2-2(k) "Pump down" Procedure

- Pump down' shall be carried out when an evaporator is replaced or when the unit is relocated in another area.

1. Remove the caps from the 2-way valve and the 3-way valve.

2 Turn the 3-way valve clockwise to close and connect a pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.

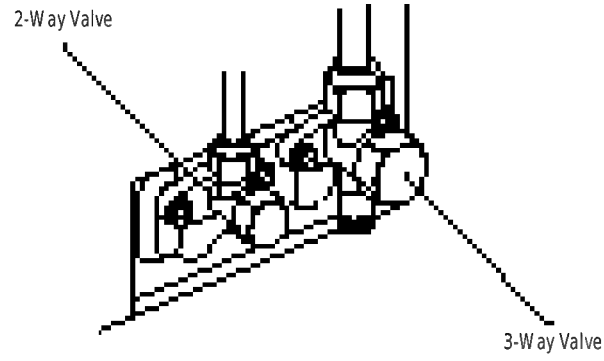
3. Set the unit to cool operation mode. (Check if the compressor is operating.)

4. Turn the 2-way valve clockwise to close.

5 When the pressure gauge indicates "0" turn the 3-way valve clockwise to close.

6. Stop operation of the air conditioner.

7. Close the cap of each valve.



Relocation of the air conditioner

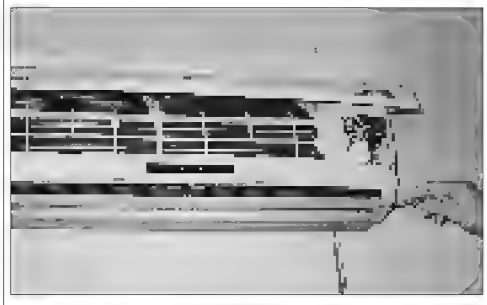
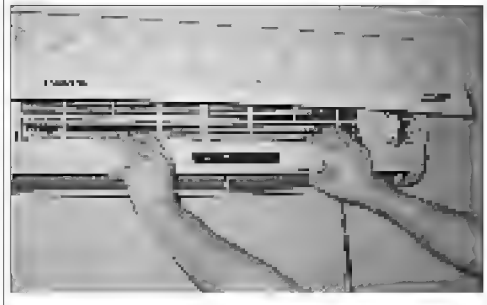
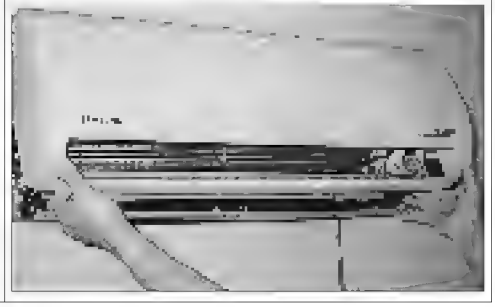
- Refer to this procedure when the unit is relocated.

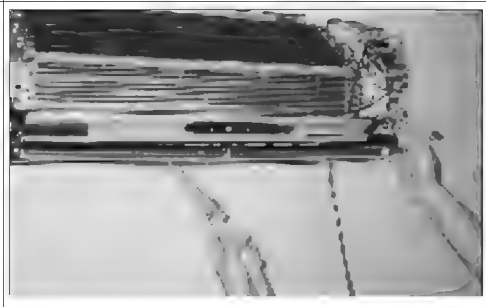
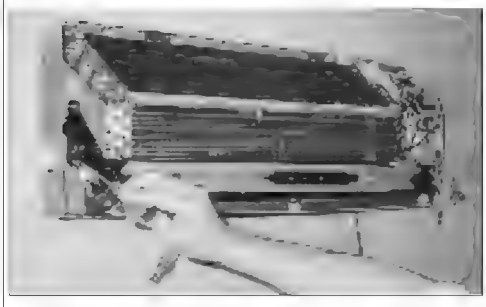
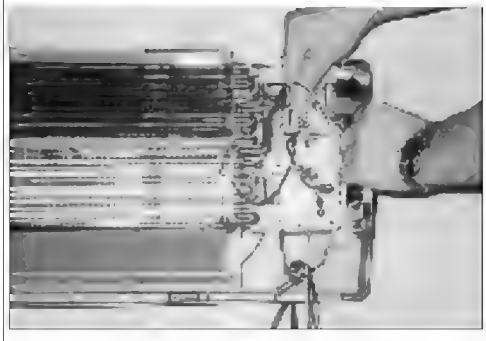
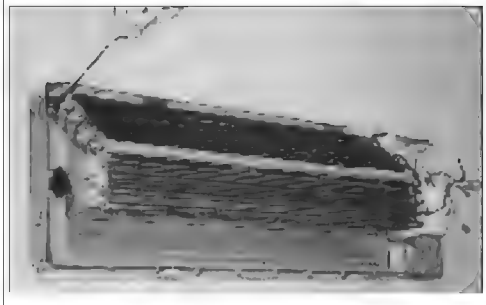
1. Carry out the pump down procedure (refer to the details of 'pump down').
2. Remove the power cord.
3. Disconnect the assembly cable from the indoor and outdoor units.
4. Remove the flare nut connecting the indoor unit and the pipe.
   At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
5. Disconnect the pipe connected to the outdoor unit.
   At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
6. Make sure you do not bend the connection pipes in the middle and store together with the cables.
7. Move the indoor and outdoor units to a new locatioon.
8. Remove the mounting plate for the indoor unit and move it to a new location.

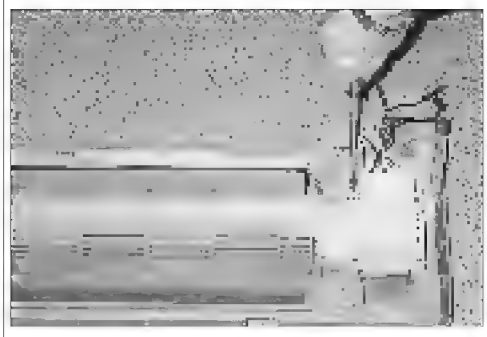
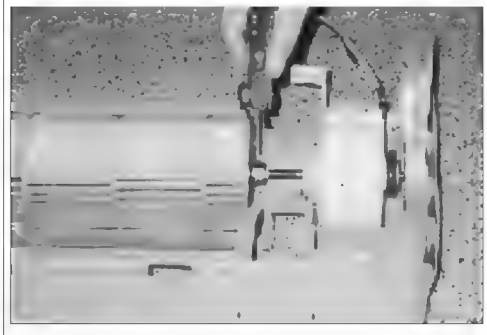
4. Disassembly and Reassembly

Stop operation of the air conditioner and remove the power cord before repairing the unit.

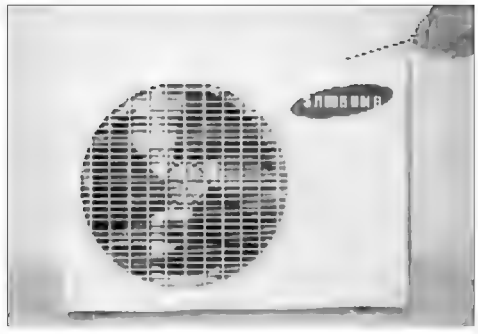
4-1 Indoor Unit

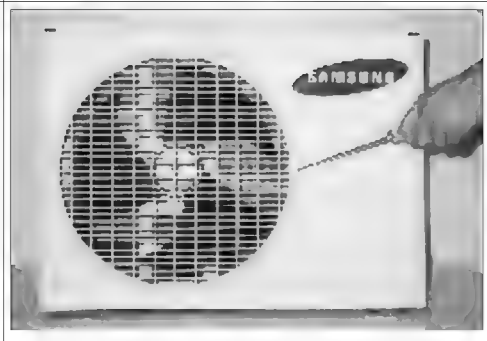
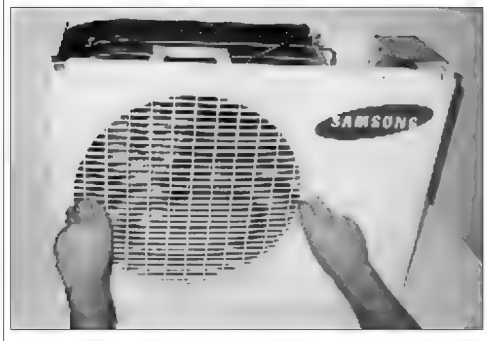
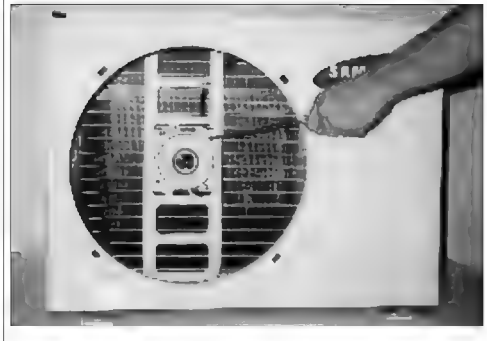
No	Parts	Procedure	Remark
1	Front Grille	1) Stop the air conditioner operation and block the main power.	
		3) Contract the second finger to the left, and right handle and pull to open the inlet grille. 4) Take the left and right filter out. 5) Loosen one of the right fixing screw and seperate the terminal cover. 6) Loosen three fixing screws of front grille.	
			
		7) Pull the upper left and right of discharge softly for the outside cover to be pulled out.	
		8) Pull softly the lower part of discharge and push it up. **Caution;** Assemble the front panel and fix the hooks of left and right.	

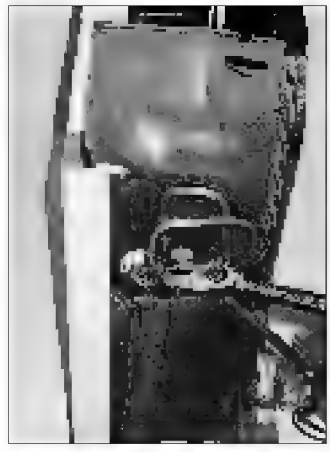
No	Parts	Procedure	Remark
2	Ass'y Tray Drain.	1) Do "1", above. Separate the drain hose from the extension drain hose. 2) Take the display PCB out. (Center of indoor unit) 3) Loosen two fixing screws of left and right 4)Pull tray drain out from the back body.	 
3	Electrical Parts (Main PCB)	1) Do "1", "2", above 2) Take all the connector of PCB upper side out. (Inclusion Power cord) 3) Separate the outdoor unit connection wire from the terminal block. 4) If pulling the Main PCB up. it will be taken out.	
4	Heat Exchanger	1) Do "1" and "2", "3", above 2) Loosen two fixing earth screws of right side. 3) Separate the connection pipe. 4) Separate the bush body at the upper side and holder at the rearside. 5) Loosen the two fixing screws of left side. 6) Lifting the heat exchanger up a little to push the up side for separation from the indoor unit.	

No	Parts	Procedure	Remark
5	Fan Motor and Cross Fan	1) Do "1" "2" "3" "4", above. 2) Loosen the fixing three screws and separate the motor holder. 3) Loosen the fixing screw of fan motor. (By use of M3 wrench) 4) Separate the fan motor from the fan. 5)Separate the fan from the left mold bearing.	 

4-2 Outdoor Unit

No	Parts	Procedure	Remark
1	Common Work	1) Loosen the fixing screw and separate the cover E-parts. 2) Separate the connection from the terminal block.	
		3) Loosen six fixing scews and seprate the upper cabinet.	
		4) Loosen the fixing screw of Ass'y E-part.	
		5) Loosen three fixing screws and separate the side cabinet.	

No	Parts	Procedure	Remark
2	Fan and Motor	1) Do "1", above. 2) Loosen fixing screw of the Guard-fan. 3) Turn the Guard-fan to separate from the cabi-front.	
		4) Remove the nut flange (Turn to the right to remove, as it is a left hand screw)	
		5) Separate the fan.	
		6) Loosen four fixing screws to separate the motor.	

No	Parts	Procedure	Remark
3	Heat Exchanger	1) Do "1", above. 2) Loosen four fixing screws of Ass'y-frame and Partition. 3) Disassemble the inlet and outlet pipe by welding. 4) Separate the heat exchanger.	
4	Compressor	1) Do "1", above. 2) Open the termonal cover of compressor and unscrew the connection terminal. 3) Disassemble the inlet and outlet pipe of compressor by welding. 4) Disassemble the inlet and outlet pipe of condenser by welding. 5) Loosen the three bolts of the lower part. 6) separate the compressor.	

5. Troubleshooting

5-1 Items to be checked first

1) Is the voltage of the power correct?
The input voltage shall be rating voltage ±10%.
The airconditioner may not operate properly if the voltage is out of this range.

2) Is the link cable linking the indoor unit and the outdoor unit linked properly?
The indoor unit and the outdoor unit shall be linked by 5 cables.
Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables.
Otherwise the airconditioner may not operate properly.

3) When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the airconditioner.

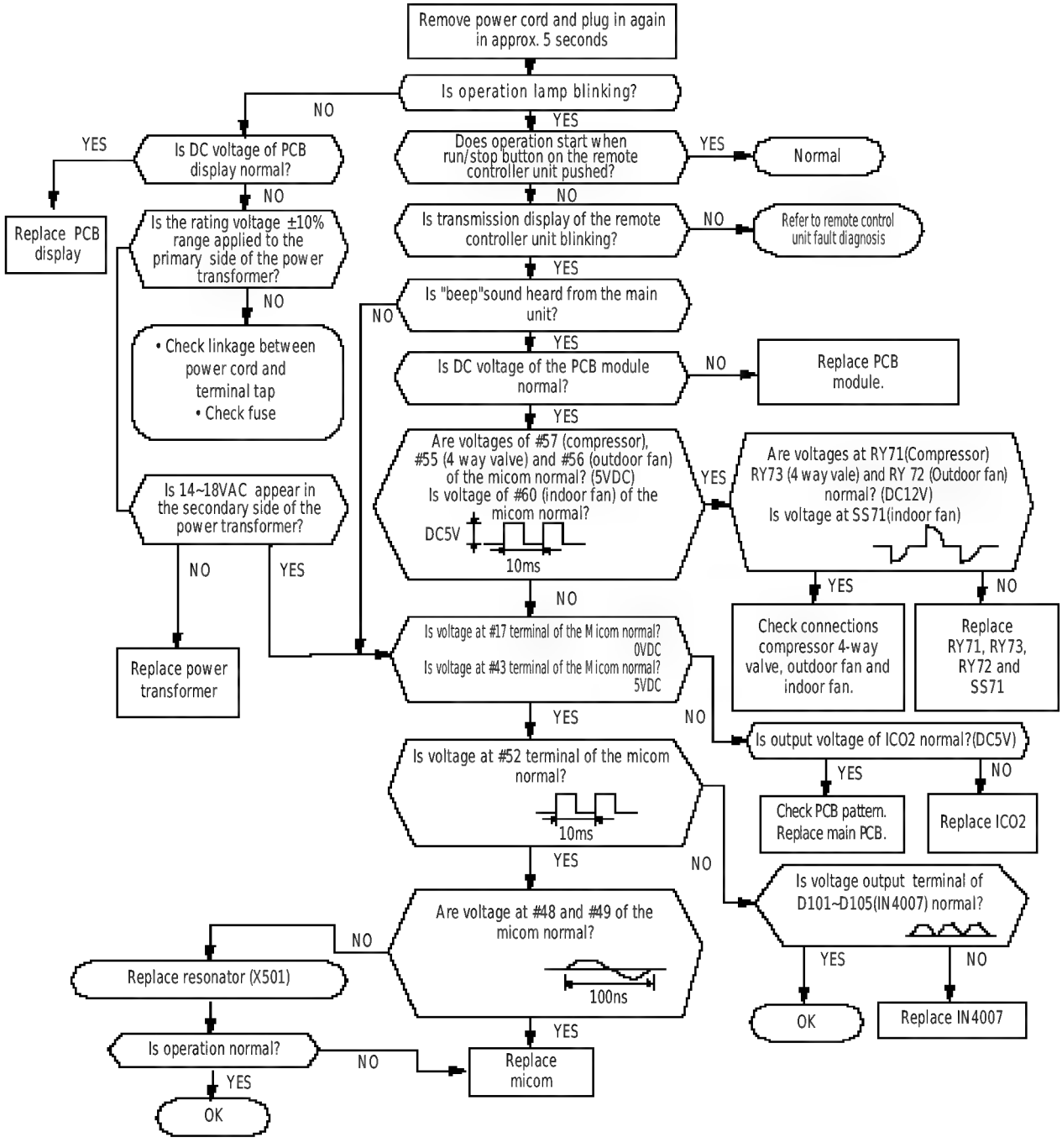
NO	Operation of air conditioner	Explanation
1	The COOL operation indication LED (Green) blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the IN DOOR FAN should operate. In a HEAT operation mode, the compressor does not operate at a room temperatrue lower than the setting temperature that indoor fan should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO or DRY mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is 5 steps is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Compressor of the outdoor unit is operating although it is turned off in a HEAT mode.	When the unit is turned off while de-ice is activated, the comperssor continues operation for up to 9 minutes (maximum) until the deice is completed.
6	Timer LED only of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
7	The compressor and indoor fan stop intermittently in HEAT mode.	The compressor and indoor fan stop intermittently if room temperature exceeds a setting temperature in order to protect the compressor from overheated air in a HEAT mode.
8	Indoor fan and outdoor fan stop operation intermittently in a HEAT mode.	The compressor operates in a reverse cycle to remove exterior ice in a HEAT mode, and indoor fan and outdoor fan do not operate intermtently for within 20% of the total heater operation
9	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

4) Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.

NO	Display	Self Diagnosis
1	Operating LED blinking (1Hz)	Restore from power failure (input initial power)
2	TIM ER LED blinking (1Hz)	Indoor unit Room sensor Error (open or short)
3	OPERATING and TIM ER LED blinking (1Hz)	Indoor unit heat exchanger temperature sensor Error (open or short)
4	FAN LED blinking (1Hz)	Indoor fan malfunctioning (for spead is Below 380rpm)

5-2-1 No Power (completely dead)-Initial diagnosis

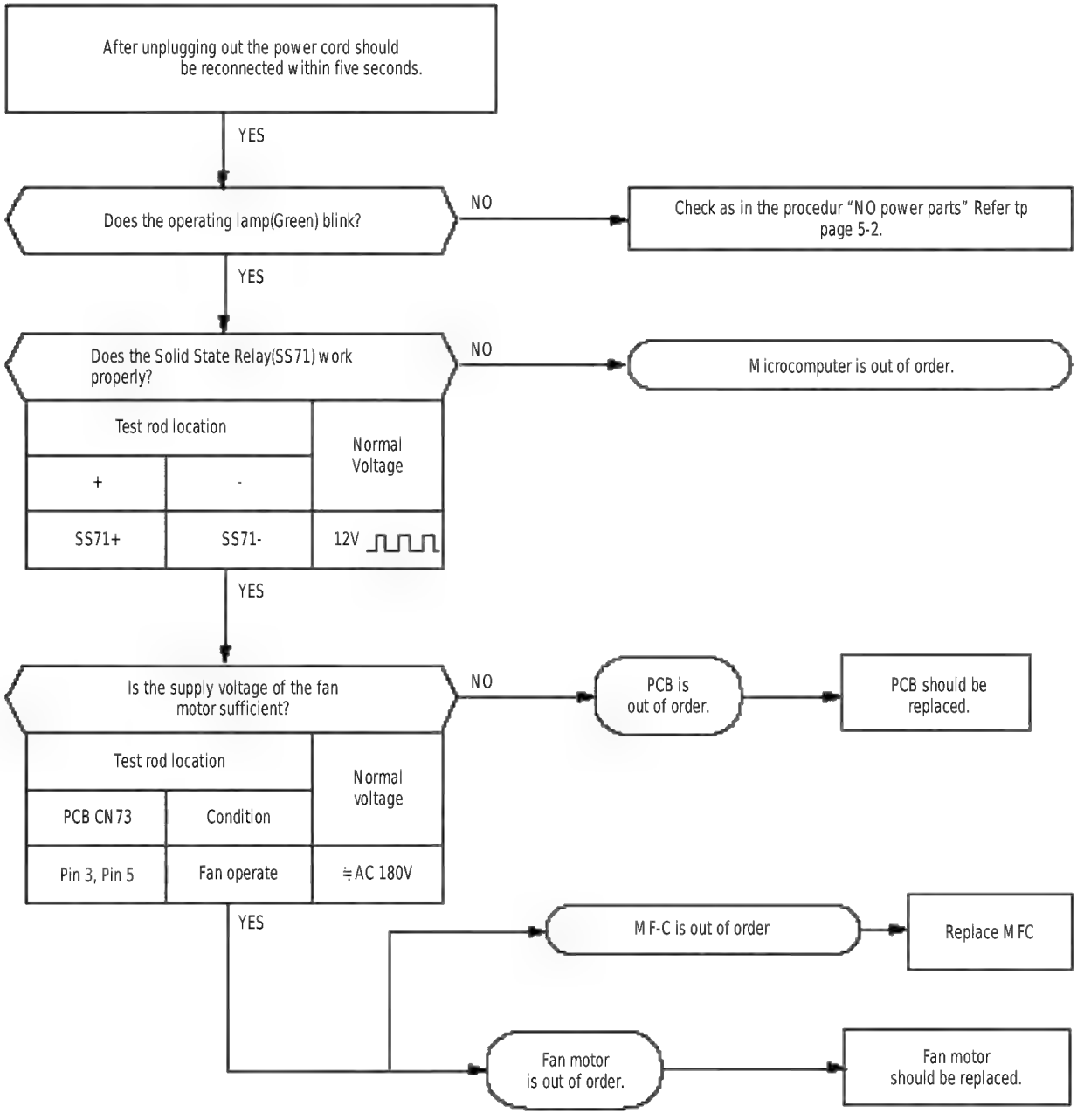
1) Checklist :
   (1) Is input voltage normal? (the rating voltage ±10% range)
   (2) Is AC power linked correctly?
   (3) Are connections between primary side, secondary side of the power transformer and PCB good.
   (4) Is output voltage of DC regulator IC KA7812 (IC01) normal? (11VDC-12.5VDC)
   (5) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)


Remove power cord and plug in again in approx. 5 seconds
Is operation lamp blinking?
NO
YES
Is DC voltage of PCB display normal?
YES
Replace PCB display
NO
Is the rating voltage ±10% range applied to the primary side of the power transformer?
NO
• Check linkage between power cord and terminal tap
• Check fuse
Is 14~18VAC appear in the secondary side of the power transformer?
NO
YES
Replace power transformer
Does operation start when run/stop button on the remote controller unit pushed?
YES
Normal
NO
Is transmission display of the remote controller unit blinking?
NO
Refer to remote control unit fault diagnosis
YES
Is "beep"sound heard from the main unit?
NO
YES
Is DC voltage of the PCB module normal?
NO
Replace PCB module.
YES
Are voltages of #57 (compressor), #55 (4 way valve) and #56 (outdoor fan) of the micom normal? (5VDC)
Is voltage of #60 (indoor fan) of the micom normal?
DC5V
10ms
YES
Are voltages at RY71(Compressor) RY73 (4 way vale) and RY 72 (Outdoor fan) normal? (DC12V)
Is voltage at SS71(indoor fan)
YES
NO
Check connections compressor 4-way valve, outdoor fan and indoor fan.
Replace RY71, RY73, RY72 and SS71
NO
Is voltage at #17 terminal of the Micom normal? 0VDC
Is voltage at #43 terminal of the Micom normal? 5VDC
YES
NO
Is output voltage of ICO2 normal?(DC5V)
YES
NO
Check PCB pattern. Replace main PCB.
Replace ICO2
Is voltage at #52 terminal of the micom normal?
10ms
YES
NO
Is voltage output terminal of D101~D105(IN4007) normal?
YES
NO
OK
Replace IN4007
Are voltage at #48 and #49 of the micom normal?
100ns
NO
YES
Replace resonator (X501)
Is operation normal?
NO
YES
OK
Replace micom

5-2-2 When the Indoor Unit Fan Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is the indoor unit fan motor properly connected with the connector (CN73)?
   (2) Is the AC voltage correct?
   (3) Is HALL IC in indoor fan motor properly connected with the connector (CN43)?
   (4) Is the running capacitor properly connected with the solder part of the PCB?

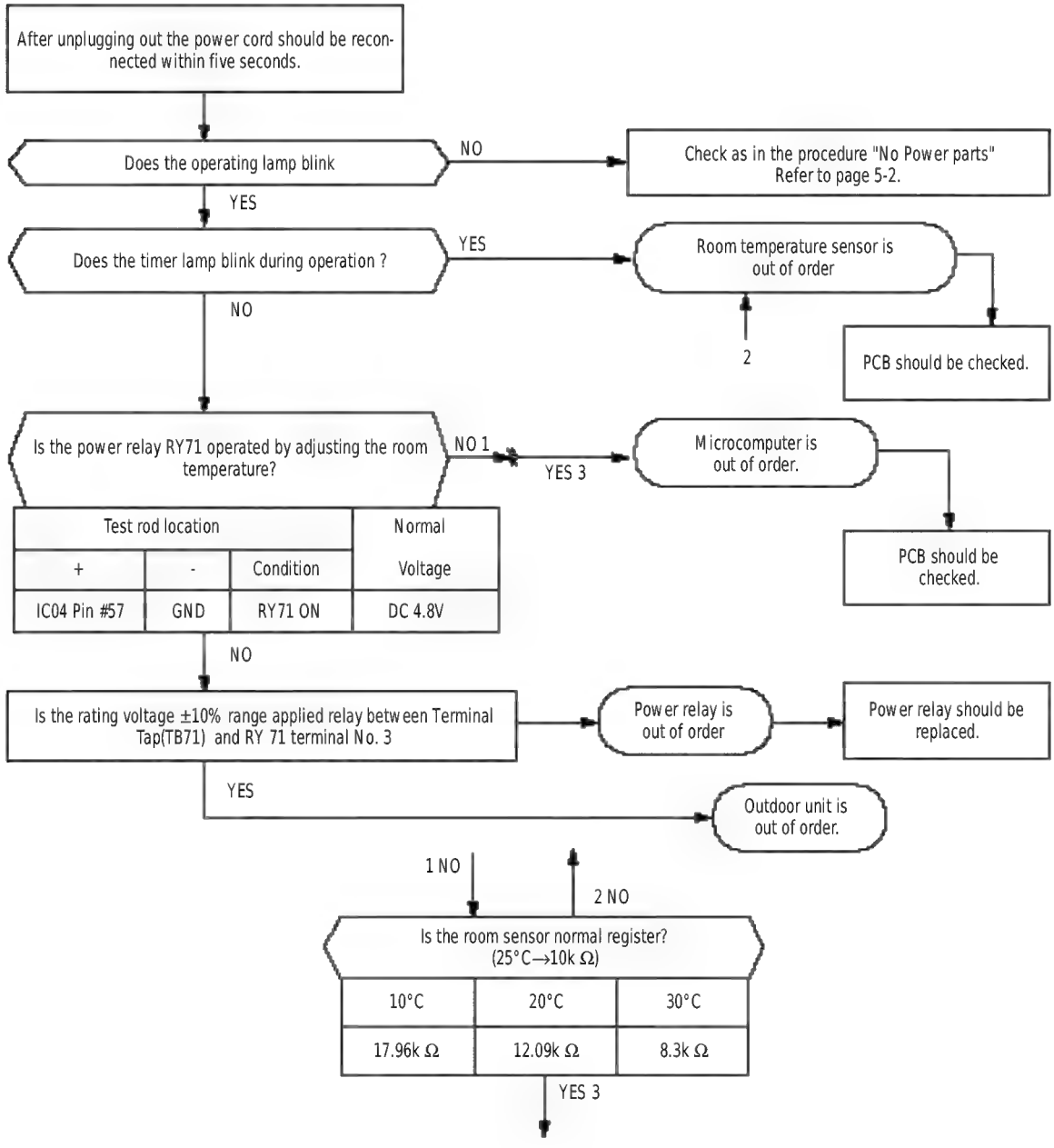
2) Troubleshooting procedure



5-2-3 When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is input voltage normal?(rating voltage ±10% range)
   (2) Is the set temperature of the remote control higher than room temperature in COOL mode?
   (3) Is the set temperature of the remote control lower than room temperature in HEAT mode?
   (4) Is the POWER IN connector (terminal-tab and POWER RELAY) linked correctly?
   (5) Is the outdoor unit properly connected with the TERMINAL BLOCK connector (TERMINAL #1 and #3)?

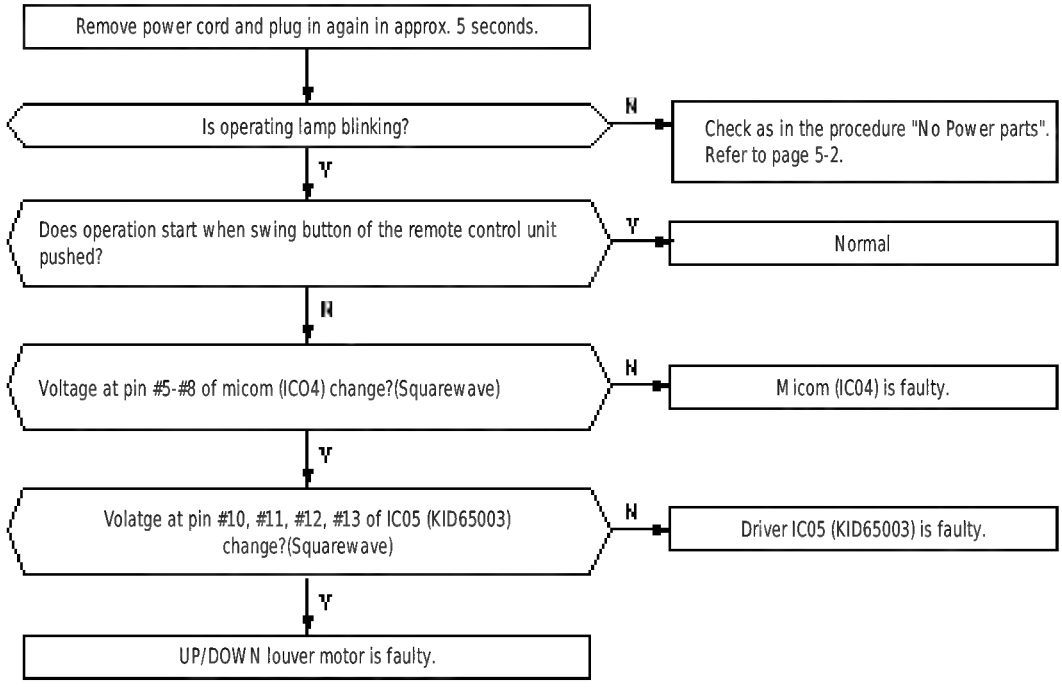
2) Troubleshooting procedure



5-2-4 When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)

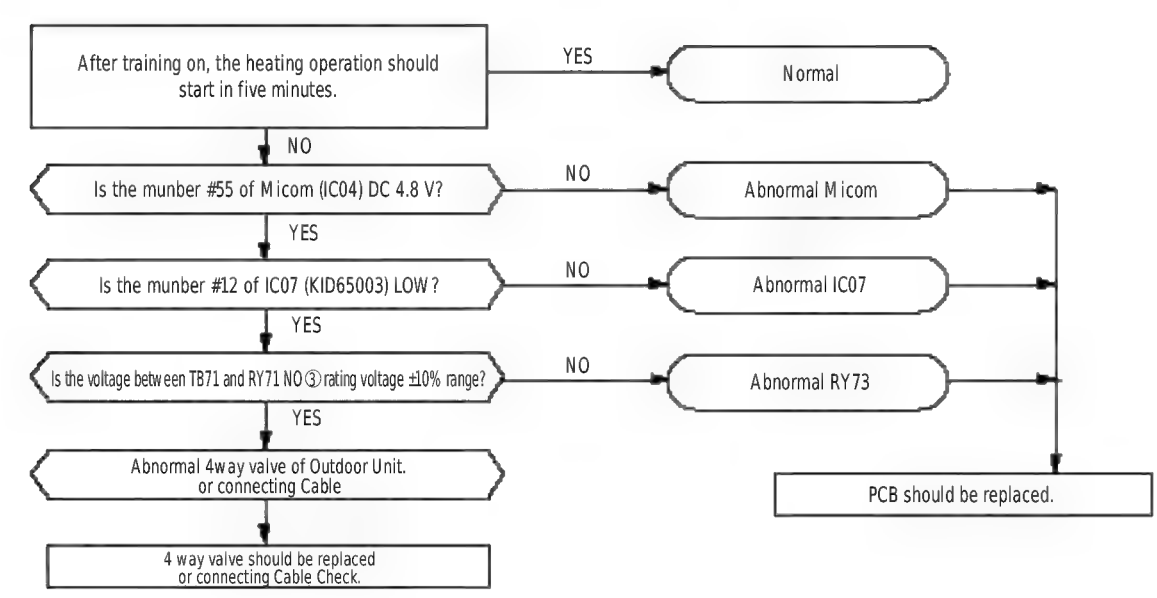
1) Checklist :
   (1) Is input voltage normal? (rating voltage ±10% range)
   (2) Is the UP/DOWN louver motor properly connected with the connector (CN61)?

2) Troubleshooting procedure


Remove power cord and plug in again in approx. 5 seconds.
Is operating lamp blinking?
N
Check as in the procedure "No Power parts". Refer to page 5-2.
Y
Does operation start when swing button of the remote control unit pushed?
Y
Normal
N
Voltage at pin #5-#8 of micom (IC04) change?(Squarewave)
N
Micom (IC04) is faulty.
Y
Volatge at pin #10, #11, #12, #13 of IC05 (KID65003) change?(Squarewave)
N
Driver IC05 (KID65003) is faulty.
Y
UP/DOWN louver motor is faulty.

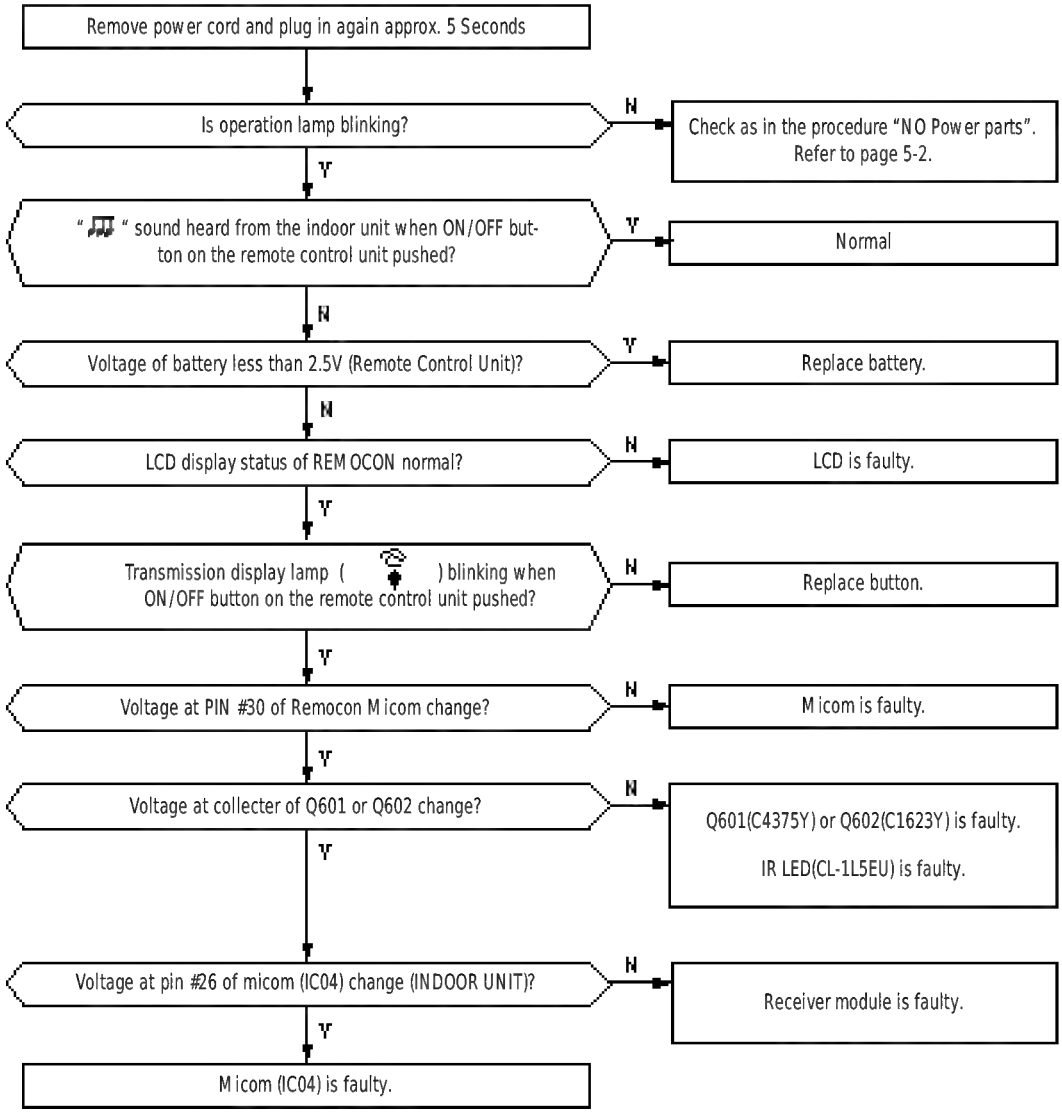
5-2-5 In the Heat mode, When there is no warm air current. Check this first;

(1) Is the set temperature of Remote Control lower than room temperature in Heat mode?
(2) Is the Indoor PCB properly connected with the CN71, power cord connector?


After training on, the heating operation should start in five minutes.
YES
Normal
NO
Is the munber #55 of Micom (IC04) DC 4.8 V?
NO
Abnormal Micom
YES
Is the munber #12 of IC07 (KID65003) LOW?
NO
Abnormal IC07
YES
Is the voltage between TB71 and RY71 NO③ rating voltage ±10% range?
NO
Abnormal RY73
YES
Abnormal 4way valve of Outdoor Unit. or connecting Cable
4 way valve should be replaced or connecting Cable Check.
PCB should be replaced.

5-2-6 If Operation By Remote Control Unit Is Impossible. (Initial Diagnosis)

1) Troubleshooting procedure


Remove power cord and plug in again approx. 5 Seconds
Is operation lamp blinking?
N
Check as in the procedure "NO Power parts". Refer to page 5-2.
Y
" " sound heard from the indoor unit when ON/OFF button on the remote control unit pushed?
Y
Normal
N
Voltage of battery less than 2.5V (Remote Control Unit)?
Y
Replace battery.
N
LCD display status of REMOCON normal?
N
LCD is faulty.
Y
Transmission display lamp ( ) blinking when ON/OFF button on the remote control unit pushed?
N
Replace button.
Y
Voltage at PIN #30 of Remocon Micom change?
N
Micom is faulty.
Y
Voltage at collecter of Q601 or Q602 change?
N
Q601(C4375Y) or Q602(C1623Y) is faulty.
IR LED(CL-1L5EU) is faulty.
Y
Voltage at pin #26 of micom (IC04) change (INDOOR UNIT)?
N
Receiver module is faulty.
Y
Micom (IC04) is faulty.

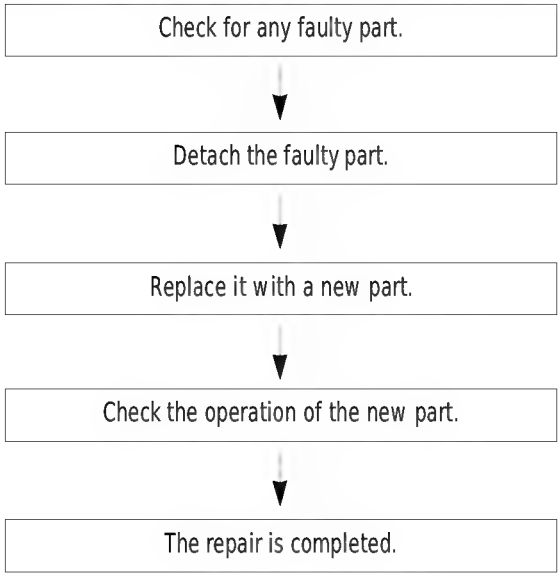
5-3 PCB Inspection

5-3-1 Cautions for Part Replacement

1. The human body carries much static electricity. Before touching a part for repair, replacement or the similar purpose, be sure to touch a grounded metallic portion by hand to let the static electricity go through the matallic portion to the earth. Especially when handling any micro computer or IC, carefully remove such static electricity before touching them.
2. When repairing any part on a work bench, be sure to place an insulative sheet on the bench and always keep the sheet surface neat without any metal fragments. If any such fragment touches a part, a secondary trouble will possibly be caused in the part.
3. Before replacing any parts, be sure to turn off the power supply. If such replacement is done with the power supply kept on, an electric shock, short circuit or destruction of a part may result.
4. During replacement or repair of a part, carefully handle it : The printed circuit board has fine lead wires (jumper wires) and glass-made parts (diode) on its substrate. So if a circuit board is roughly handled, such lead wires and parts will be easily broken or damaged by bending or shock.
5. When soldering the lead wires of any new part, be sure to polish them using an emery paper or the like before solding them. Since the lead wires of any new part are covered with an oxide film, solder cannot adhere to the lead wires if not polished.
6. When soldering any part, care should be exercised not to apply any high-wattage soldering iron to the part for a long time. Some parts are of so low a heat resistance that they may be broken or have the properties changed if a soldering iron is so applied (Otherwise, the pattern may possibly be separated and raised).
7. The heat of the soldering iron should be transfered to the entire object to be soldered. If the solder pieces are not well fused due to insufficient transfer of the heat from the soldering iron, no satisfactory electrical continuity can be assured even if the soldered objects appear well connected to each other.
8. The solder used should be limited to a minimum. If excessive solder is used, it will cause inter-pattern contact, which may cause malfunction of the circuit.

5-3-2 Procedure

The parts should be replaced in the following procedure.


Check for any faulty part.
Detach the faulty part.
Replace it with a new part.
Check the operation of the new part.
The repair is completed.

5-3-3 Detailed Procedure

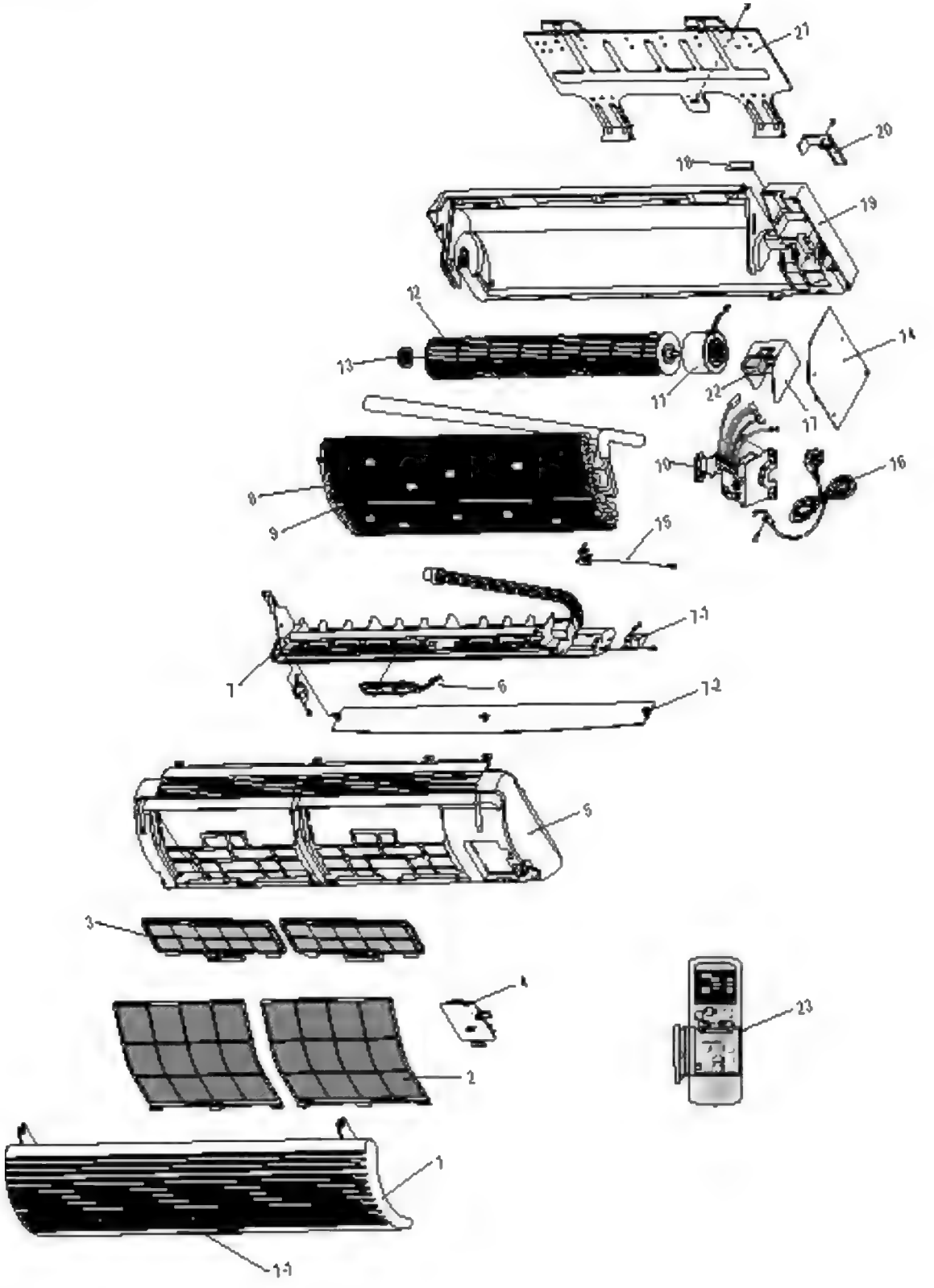
No.	Malfunction	Checking point (symptoms)	Causes
1	Pull out the power plug from the AC terminal and confirm the fuse on the PCB assembly	1. Is the broken?	1. Voltage over 2. Indoor unit fan motor short-circuit.
2	Turn the power on. If lamp blinks trouble is not related to the items 1 through 4 on the right.	Voltage check	
		1. AC voltage at both end of transformer Primary? ; rating voltage ±10% range	1. Irregular power code or power fuse, or poor wiring.
		2. AC voltage at both end of transformer secondary? ; 14- 18Vac	2. Transformer is faulty.
		3. DC voltage at OUT and GND of IC01 (KA7812)? ; 12VDC	3. Power circuit is faulty.
		4. DC voltage at OUT and GND of IC02? ; 5VDC	4. Power circuit is faulty.
		5. DC voltage at Q201 Base and GND change? ; squarewave	5. Q201 is faulty. D101~D104 (IN4007)
3	Set operating mode when RMC switch pushed. Except for [FAN]mode and [TIMER] mode.	Voltage check	
		1. Voltage of relay (RY71) coil Voltage at PIN#11, PIN#12, PIN#15 of IC07 ; 12VDC	1. Relay(RY 71) coil is open. IC07 is faulty.
		2. Voltage at Terminal Tap (TB71 or 72) and RY71 Terminal NO ④ ; rating voltage ±10% range	2. Relay(RY 71) contactor is faulty.
4	Set operating mode when RMC switch pushed. 1. COOL mode 2. TURBO operating	1. Compressor does not operate.	1. PCB is faulty. 2. Connecting is faulty.
5	Set operating mode when RMC switch pushed. 1. HEAT mode 2. TURBO operating	1. Compressor does not operate	1. PCB is faulty. 2. Connecting is faulty.
6	Set operating mode when RMC switch pushed. 1. [FAN] mode 2. Fan speed [Hi] 3. Continuously operation	1. Voltage at ③⑤ both ends of CN73 : above 180V~	1. Indoor unit fan motor is faulty.
		2. Indoor unit fan motor does not operate.	2. Poor connection of indoor fan motor and connector of RPM sensing (CN43)

5-4 Fault Diagnosis of Major Parts

<table>
<tr><th>Parts</th><th colspan="2">Diagnosis</th></tr>
<tr><td>Temp.Sensor</td><td colspan="2">Measure resistance with a tester.</td></tr>
<tr><td>Heat ex. Sensor</td><td>Normal</td><td>8KΩ~27KΩ at ambient temperature (+0°C ~ +30°C)</td></tr>
<tr><td></td><td>Abnormal</td><td>∞, O Ω ... open or short</td></tr>
<tr><td>Indoor Fan Motor</td><td colspan="2">Measure resistance between terminals (CN73) with a tester</td></tr>
<tr><td></td><td>Normal</td><td>At ambient temperature (10°C ~ 30°C)
<table><tr><th>between</th><th>Resistance</th></tr><tr><td>Blue, Yellow</td><td>285Ω</td></tr><tr><td>Red, Blue</td><td>185Ω</td></tr></table></td></tr>
<tr><td></td><td>Abnormal</td><td></td></tr>
<tr><td></td><td colspan="2">Measure the voltage between ground and signal wire of the fan motor</td></tr>
<tr><td></td><td>Normal</td><td><table><tr><th>between</th><th>Voltage</th></tr><tr><td>Gray, Orange</td><td>0.5V~4.5V</td></tr><tr><td>Yellow, Orange</td><td>5V</td></tr></table></td></tr>
<tr><td></td><td>Abnormal</td><td>Abnormal if voltage does not change from 0V to 5V.</td></tr>
<tr><td>Outdoor Fan Motor</td><td>Normal</td><td>At ambient temperature (10°C ~ 30°C)
<table><tr><th>between</th><th>Resistance</th></tr><tr><td>Black, Yellow</td><td>255Ω</td></tr><tr><td>Black, Red</td><td>360Ω</td></tr></table></td></tr>
<tr><td></td><td>Abnormal</td><td>∞, O Ω ... open or short</td></tr>
<tr><td>Stepping Motor
(UP/DOWN swing motor)</td><td colspan="2">Measure resistance between red wire and each terminal.</td></tr>
<tr><td></td><td>Normal</td><td>Approx. 300Ω at ambient temperature (20°C ~30°C)</td></tr>
<tr><td></td><td>Abnormal</td><td>∞, O Ω ... open or short</td></tr>
</table>

6. Exploded Views and Parts List

6-1 Indoor Unit

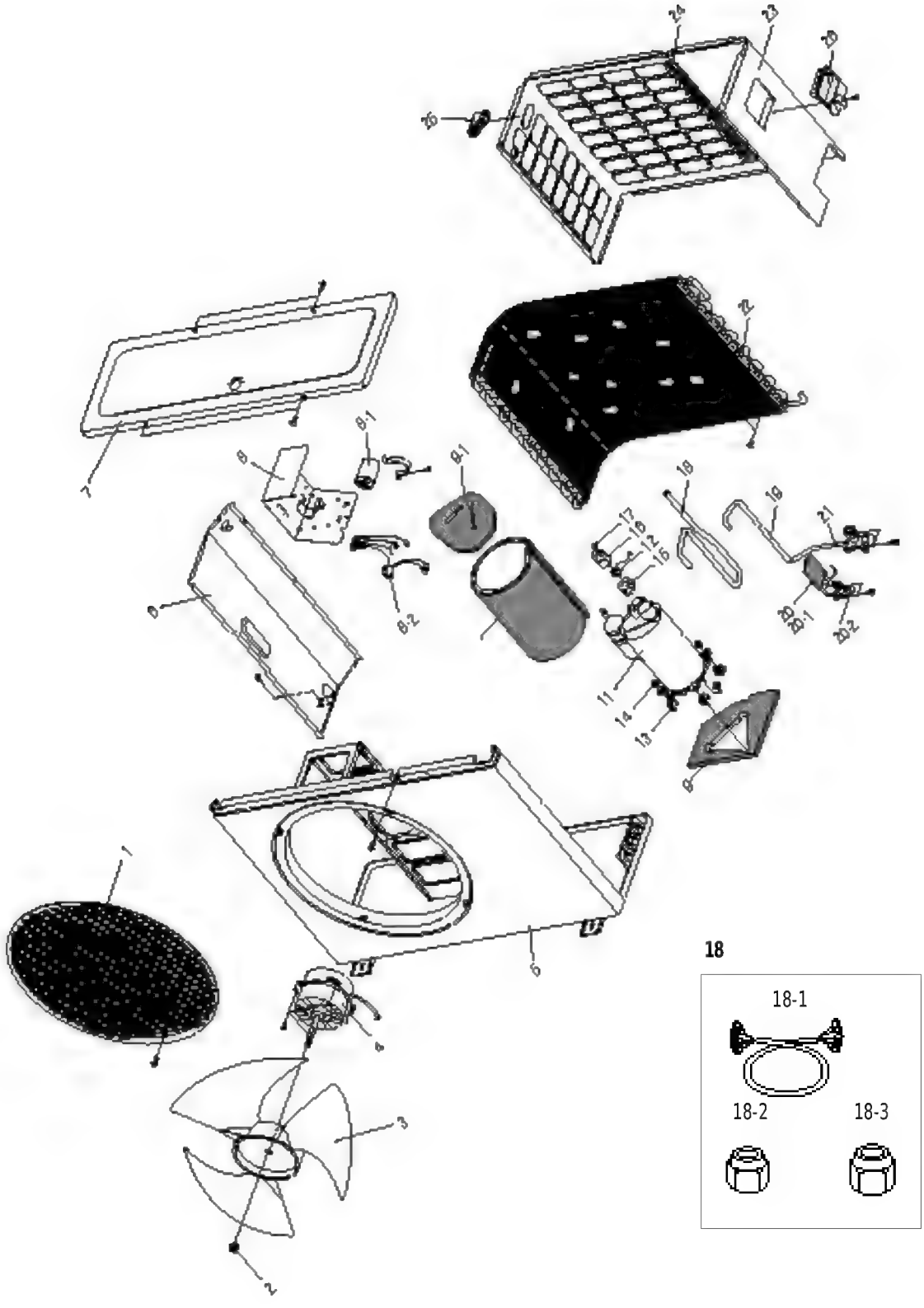


■ Parts List

No.	CODE NO	Description	Specification	Q'TY			
				AQ07A1AE	AQ07A2AE	AQ07B1AE	AQ07B2AE
1	DB64-10162A	GRILLE-AIR INLET	HIPS	-	-	-	-
	DB64-00001A	GRILLE-AIR INLET	HIPS	1	1	1	1
1-1	DB64-70098A	PANEL DISPLAY	PC	-	-	-	-
	DB64-00002A	PANEL DISPLAY	PC	1	1	1	1
2	DB63-30166B	GUARD AIR FILTER	PP	2	2	2	2
3	DB74-10108D	CLEANER FILTER ASS'Y	ASS'Y	*(1)	*(1)	*(1)	*(1)
4	DB63-10486B	COVER TERMINAL	ABS	1	1	1	1
5	DB92-70093D	ASS'Y FRONT PANEL	ASS'Y	-	-	-	-
	DB92-00004A	"	ASS'Y	1	1	1	1
6	DB93-10619A	ASS'Y DISPLAY PCB	ASS'Y	-	-	-	-
	DB93-00056A	ASS'Y DISPLAY PCB	ASS'Y	1	1	1	1
7	DB94-10086D	ASS'Y-TRAY DRAIN	ASS'Y	1	1	1	1
7-1	DB95-20138A	ASS'Y-STEP MOTOR U/D	GSP-24RW	1	1	1	1
7-2	DB66-30195A	BLADE-H	HIPS	1	1	1	1
8	DB75-40091D	ASS'Y EVAP	1.2PLATE21X2PASS	1	1	1	1
9	DB67-30058D	SPACER EVAP	PVC	1	1	1	1
10	DB61-40280A	ASS'Y HOLDER MOTOR	ASS'Y PP	1	1	1	1
11	DB31-10155A	MOTOR FAN, IN	PFS027WTVA	1	1	1	1
12	DB94-30166C	ASS'Y C-F-FAN	ø95	1	1	1	1
13	DB94-40017A	ASS'Y BEARING	ASS'Y	1	1	1	1
14	DB93-10576A	ASS'Y-MAIN PCB	ASS'Y	1	1	1	-
	( )	ASS'Y-MAIN PCB	ASS'Y	-	-	-	1
15	DB32-10046A	ASS'Y THERMISTOR	103AT	1	1	1	1
16	DB39-10062V	POWER CORD	250V 7A	1	1	1	1
17	DB61-10178A	CASE-CONTROL	ABS	1	1	1	1
18	DB61-60122A	BODY BUSH	HIPS	1	1	1	1
19	DB94-20038A	ASS'Y BACK BODY	HIPS	1	1	1	1
20	DB61-40247A	HOLDER PIPE	PP	1	1	1	1
21	DB70-10670A	PLATE HANGER	SGCC-M	1	1	1	1
22	DB26-10063B	TRANSFORMER	230VAC DC17V	1	1	1	1
23	DB93-30052R	ASS'Y REMOCON	ARH-105	*1	*1	1	1

* : option

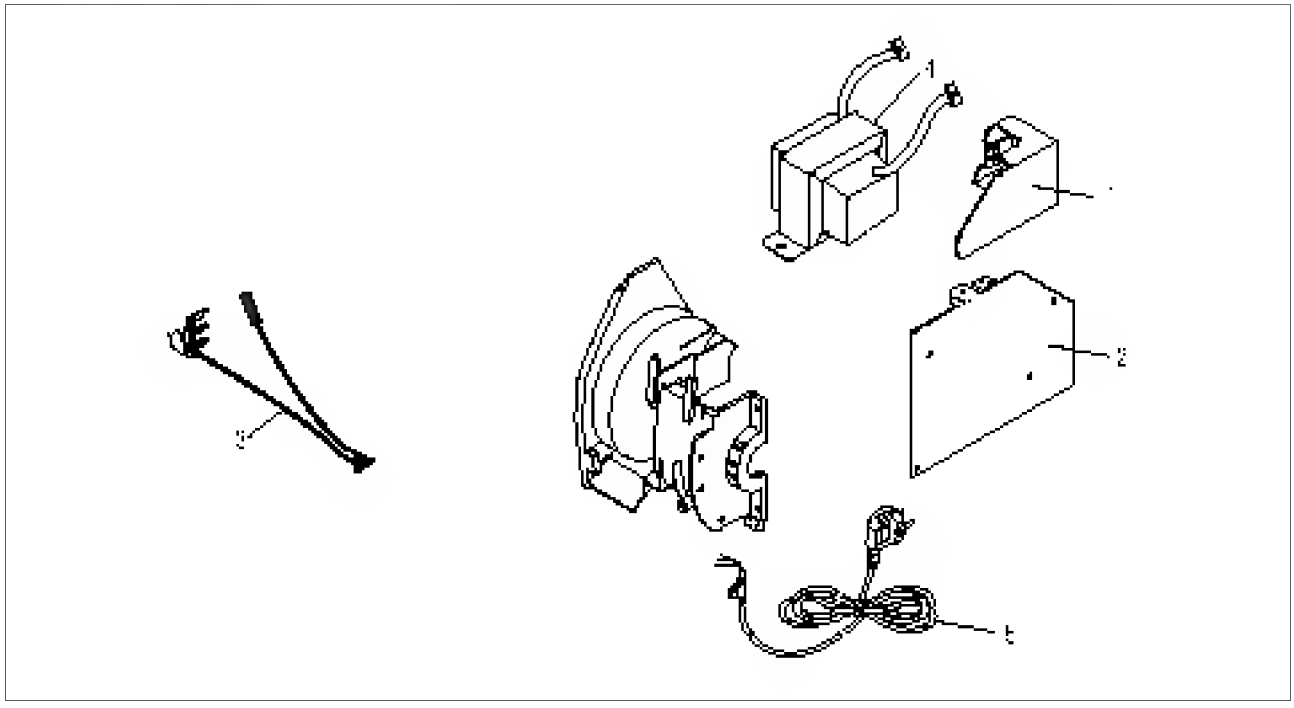
6-2 Outdoor Unit



■ Parts List

No.	CODE NO	Description	Specification	Q'TY
				UQ07**AE
1	DB63-30168A	GUARD-FAN	PC ABS	1
2	DB60-30004A	NUT-FLANGE	2C SM 20C M 6 NTR	1
3	DB67-50075A	PROPELLER-FAN	AS+G/F, ø370	1
4	DB31-10140B	M OTOR-FAN OUT	AM ASS015W TVA	1
5	DB90-50152A	ASS'Y-FRAM E	ASS'Y	1
6	DB94-50038B	ASS'Y-PARTITION	SGCC-P	1
7	DB70-40198A	CABI-UPP	SECC-P	1
8	DB93-00011A	ASS'Y-CONTROL OUT	ASS'Y	1
8-1	2501-001099	CAPACITOR	1.5/25uF 450VAC	1
8-2	DB93-50062C	ASS'Y-LEAD W IRE OUT	ASS'Y	1
9	DB72-50616A	CLOTH-COM P BOTTOM	RUB-FELT	1
9-1	DB72-50567A	CLOTH-COM P TOP	FELT	1
10	DB72-50516B	CLOTH-COM P SIDE OUT	EVA+FELT	1
11	DB95-10065P	COM PRESSOR	44H070J W 1E2	1
12	DB47-20001Y	O.L.P.	M ST24AM N-12008	1
13	DB73-10004A	GROM M ET-ISOLATOR	EPDM	3
14	DB60-30028A	NUT-W ASHER	HEX, 2C, M 8, ZPC	3
15	DB63-20002A	GASKET	EPDM	1
16	DB63-10165B	COVER-TERM INAL	NORYL	1
17	DB60-30018A	NUT-FLANGE	M 5, SM 20C	1
18	DB99-10153A	ASS'Y-TUBE DISCHARGE	ASS'Y	1
18-1	DB62-40035A	ASS'Y-TUBE SUCTION	25kg/cm^2·G	1
18-2	DB96-10665A	ASS'Y-TUBE CAPILLARY	ASS'Y	1
19	DB62-31886A	TUBE-CAPILLARY	30kg/cm^2·G	1
20	DB62-40039A	PACKED-VALVE	3/8"	1
20-1	DB62-40073B	PACKED-VALVE	1/2"	1
20-2	DB96-30293A	ASSY-COND	ASS'Y	1
22	DB72-10221V	INSUL-CABI SIDE	FOAM-PU	1
23	DB67-90024A	HANDLE CABI LF	ABS	1
24	DB63-10443A	COVER-E PART ASS'Y	ABS	1
25				

6-3-2 PCB Box

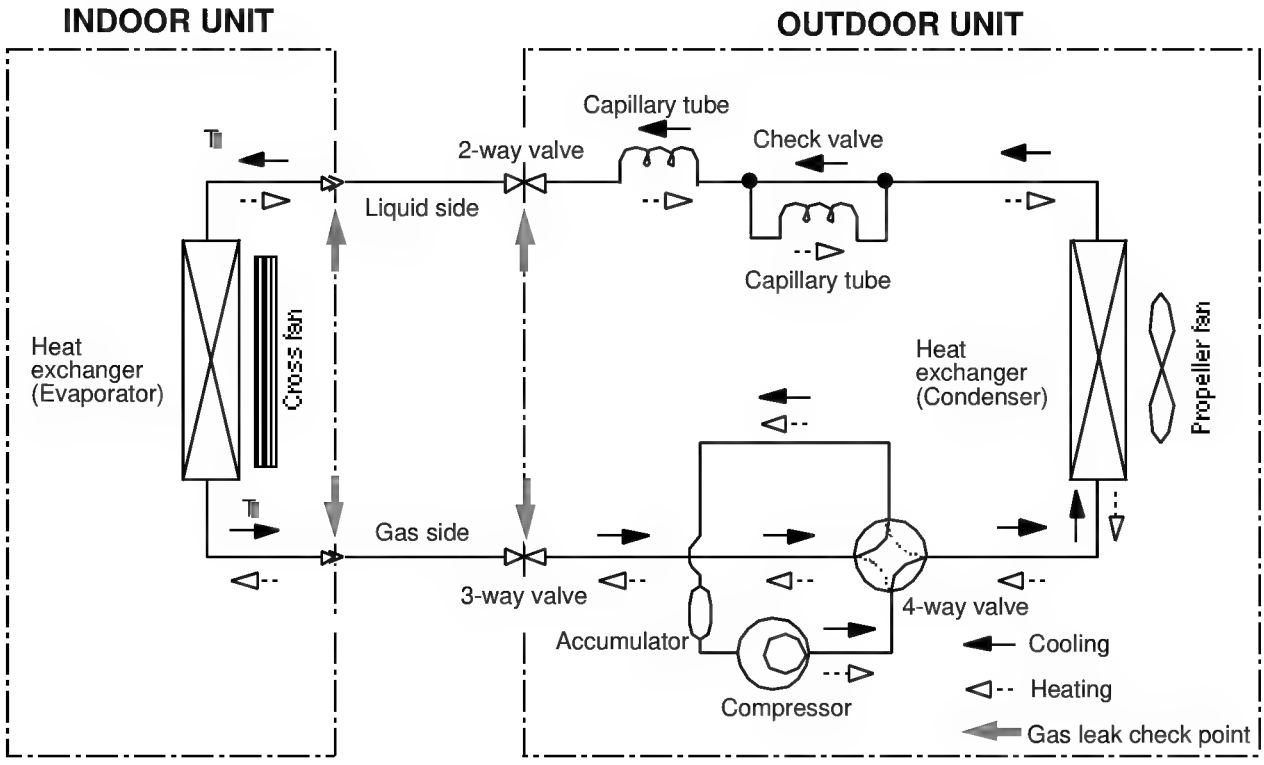


■ Parts List

No	CODE NO	Description	Specification	Q'TY		Remark
				AS07A1AE AS07B1AE	AS07A2AE AS07B2AE	
1	DB61-10151A	CASE-CONTROL	ABS	1	1	
2	DB93-10577A	ASS'Y MAIN PCB	ASS'Y	1	-	
	DB93-	ASS'Y MAIN PCB	ASS'Y	-	1	
3	DB32-10008E	ASS'Y THERMISTOR	103AT 240/240	1	1	
4	DB26-10063B	TRANSFORMER	AC230V/DC17	1	1	
5	DB39-10062V	POWER CORD	AC250V/7A	1	1	

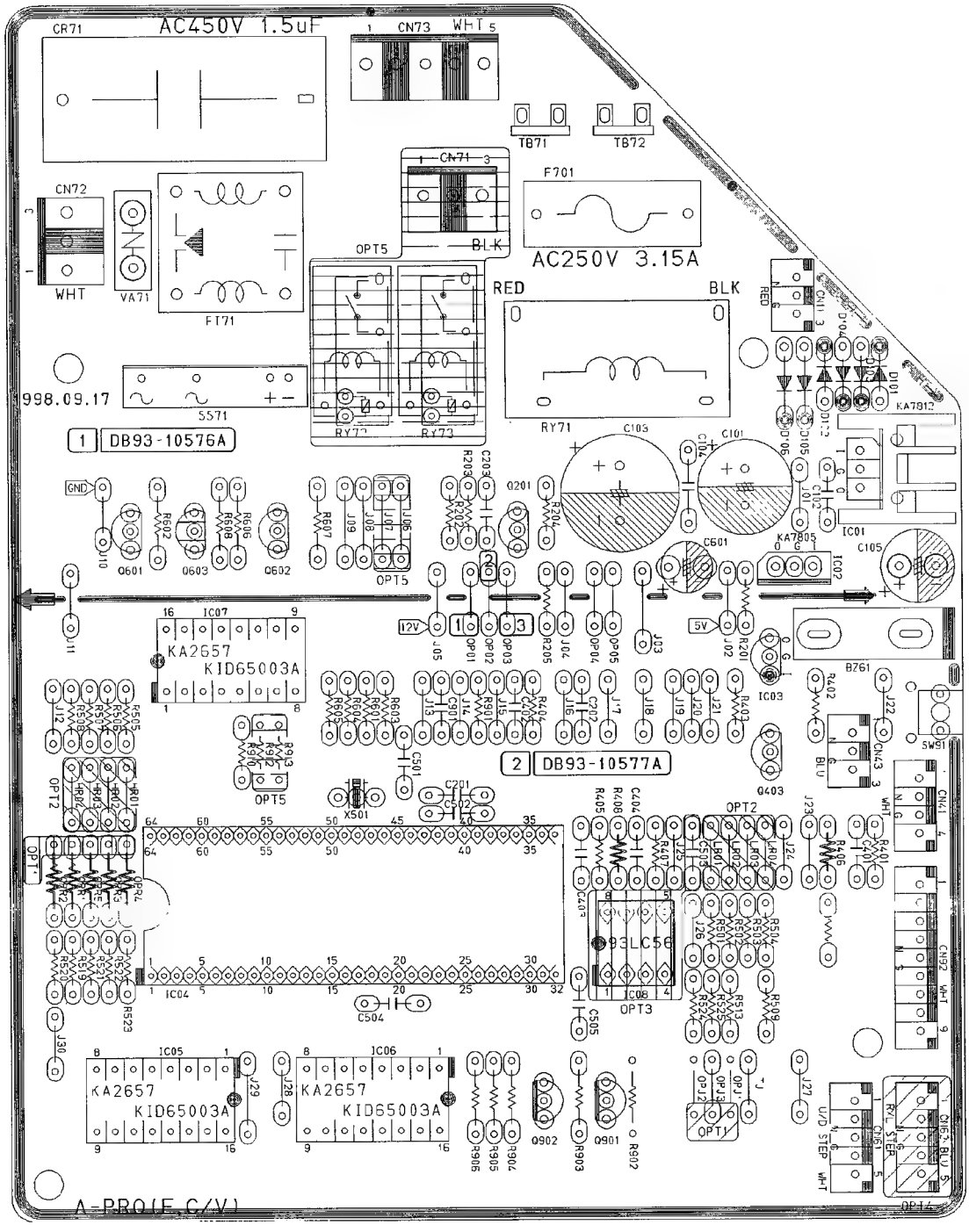
7. Block Diagrams

7-1 Refrigerating Cycle Block Diagram



8. PCB Diagrams

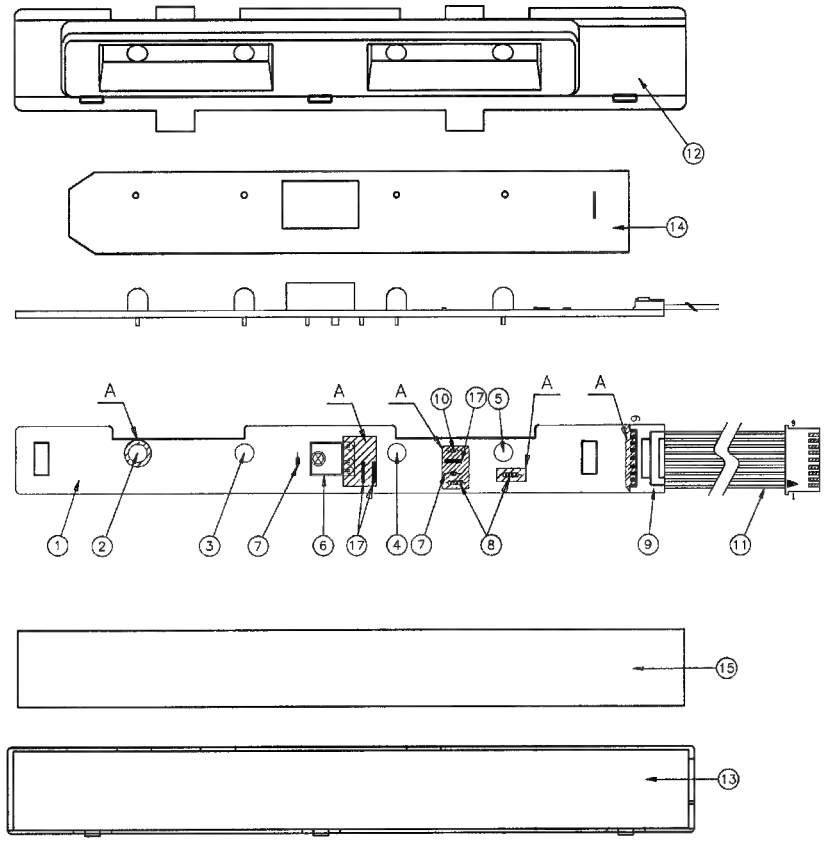
8-1 Main PCB(DB93-10576A) : AQ07A1AE, AQ07B1AE
(DB93-) : AQ07A2AE, AQ07B2AE



■ Parts List

No.	CODE NO	Description	Specification	Q'TY			
				AQ07A1AE	AQ07A2AE	AQ07B1AE	AQ07B2AE

8-2 ASS'Y DISPLAY & MODULE PCB : DB93-10619B

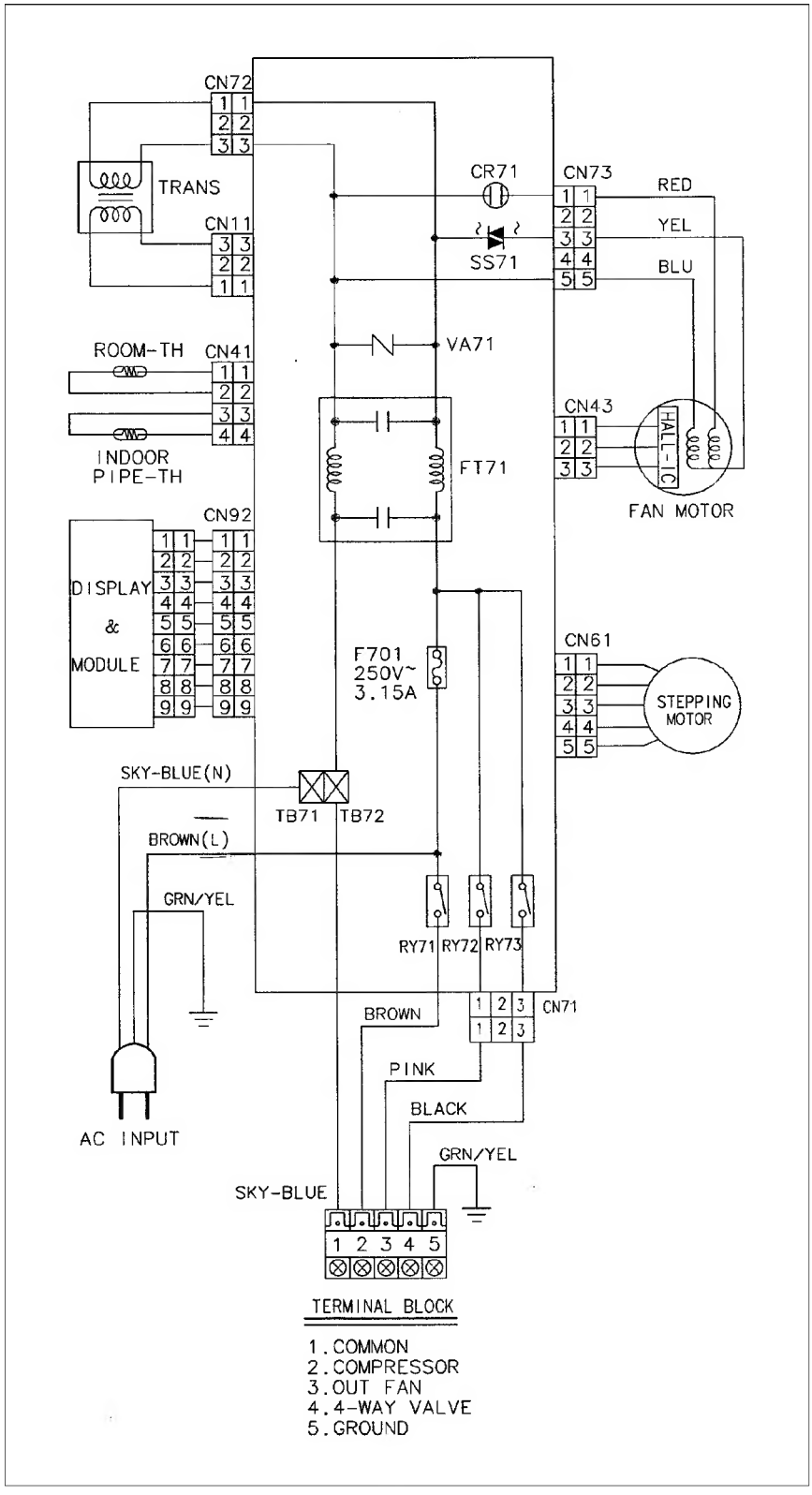


■ Parts List

No	CODE NO	Description	Specification	Q'TY	Remark
1	DB41-10204B	PCB-DISPLAY	FR-1 T1.6 W 20 L167	1	
2	0601-001333	LED-LAMP	LTL-30EHJ (ORG/GRN)	1	
3	0601-001059	LED-LAMP	SY5511(YEL)	1	
4	0601-001060	LED-LAMP	SM5511(GRN)	1	
5	0601-001196	LED-LAMP	SO5511(ORG)	1	
6	DB32-50027A	MODULE REMOCON	PNA4612M00XD	1	
7	2202-000780	C-CERAMIC	CA 0A 50V 104Z	2	
8	2001-000034	R-CARBON	RD 1/4TP 221-J	2	
9		CONNECTOR WAFER	YWLA200-09P	1	
10	2201-000283	C-CERAMIC	CA 0A 50V 102Z	1	
11	DB39-20346A	C/W DIS & MODULE	UL1007 AWG#26/9	1	
12	DB61-10196A	CASE-CENTER PCB	PC, BLUE	1	
13	DB63-10500A	COVER DISPLAY	ABS, BLK	1	
14	DB72-10246A	SEAL DISPLAY UPP	FOAM-PE, BLK	1	
13	DB72-10250A	SEAL CASE DISPLAY	30FOAM-PE	1	
16		JUMP-WIRE	6mm	3	
A		PAINT	DCR200H(BROWN)		

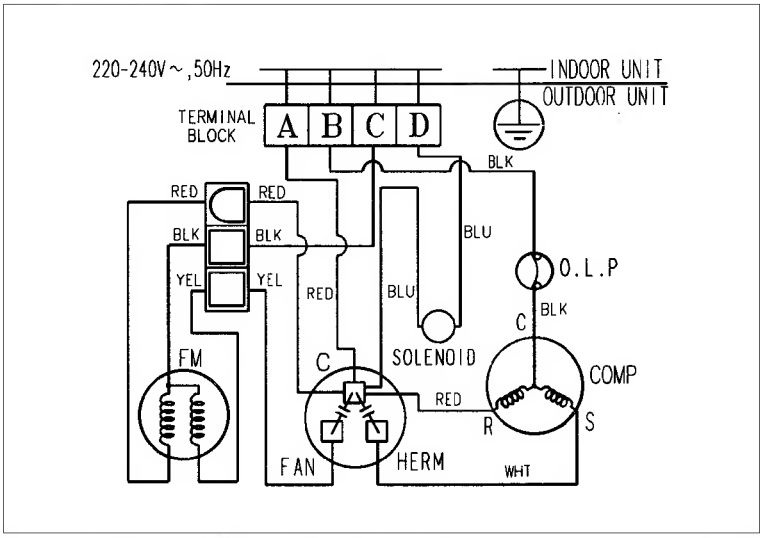
9. Wiring Diagrams

9-1 Indoor Unit



9-2 Outdoor Unit

■ US07**AE



MODEL	UQ07B1AE/UQ07B2AE/UQ07A1AE/UQ07A2AE
CAPACITOR	1.5/25uF 450VAC

UPDA TE LOG SHEET

Application date	Page	Part#	Note(Cause & Solution)	S/Bulletin#

Use this page to keep any special servicing information. (Service Bulletin, etc.)
If only parts number changes, Just change parts number directly on parts list.
And if you need more information, please see the service bulletin

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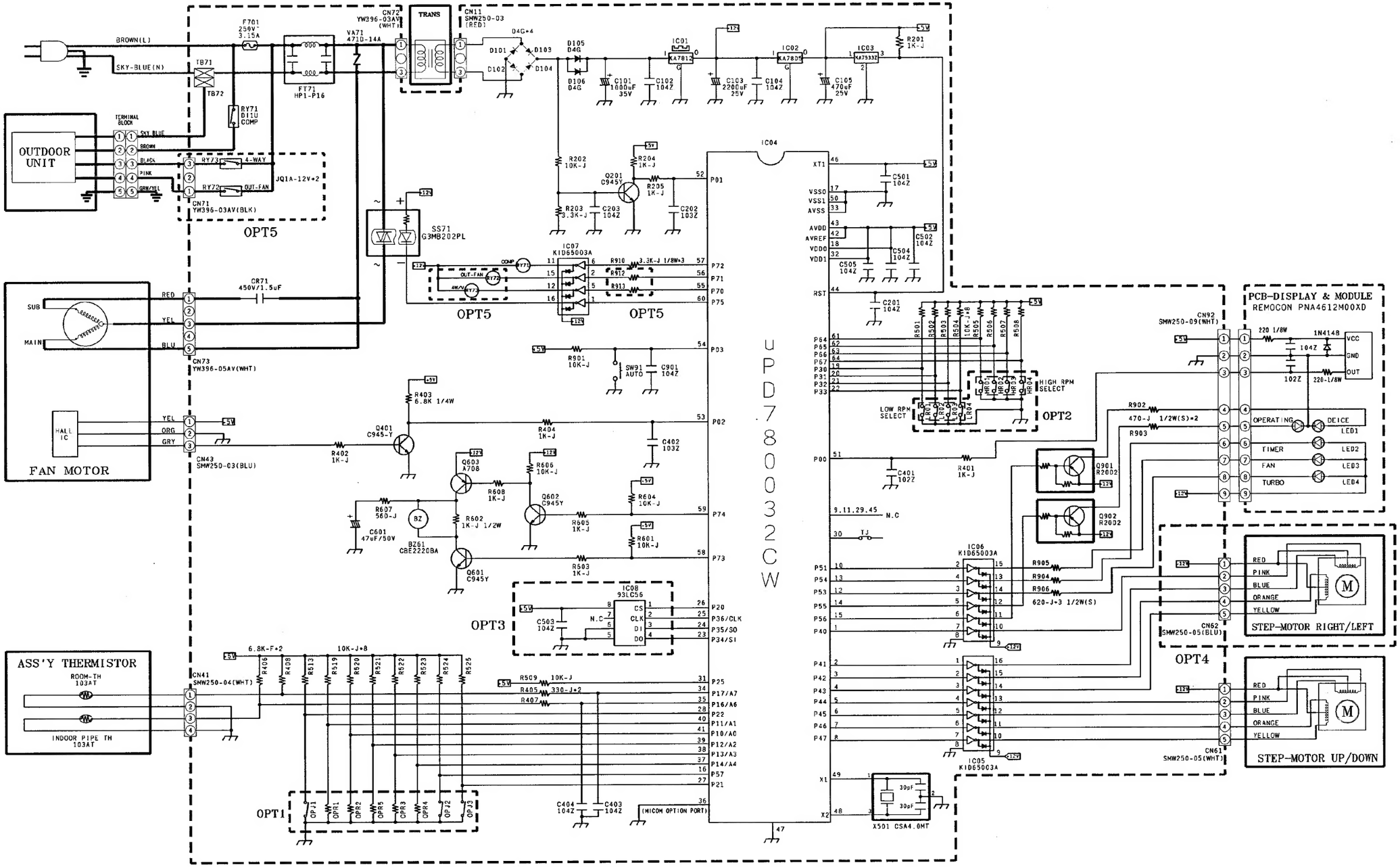
10. Schematic Diagrams

10-1 Indoor Unit